

Jaguars of the Pantanal and their Conservation



by Paul Donahue

Friday, December 17, 2010

Wilson along the Rio Cuiabá - 07 June 2009

Corixo São Pedrinho - June 2009



The Jaguar is the largest cat in the Americas and the third largest in the world.

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Wilson along the Rio Cuiabá, 26 June 2009.



It's admired and feared throughout its range.

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Nearly all indigenous cultures of Latin America, from the pre-Colombian to the present, hold the Jaguar among their most important deities.....from *The Jaguar* by Rafael Hoogesteijn and Edgardo Mondolfi, 1992, Armitano Publishers (Armitano Editores C.A.)

Wilson along the Rio Cuiabá, 04 July 2009.



Jaguar along the Rio Madre de Dios, southeastern Perú.

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- I've worked in South America since 1972 but was seriously jinxed when it came to seeing Jaguars.
- I FINALLY saw my first Jaguar in 2007 in southeastern Perú.



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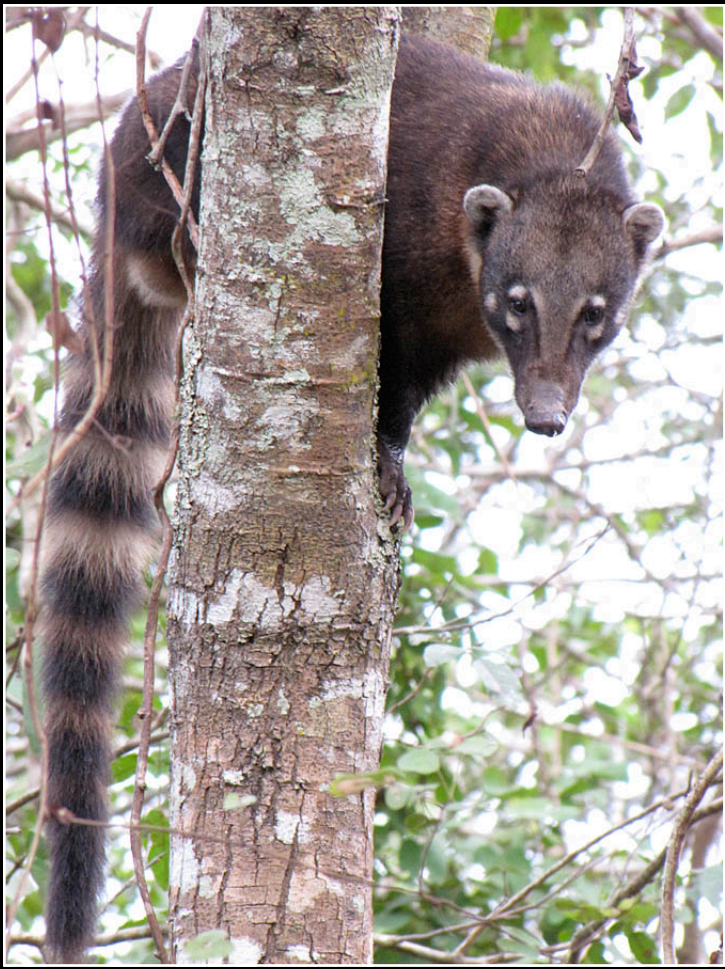
- I used to be 100% focused on birds....I've watched birds and have drawn and painted them for most of my life, but after seeing my first Jaguar in the wild, I decided they made much more interesting subjects and that I needed to spend a lot more time with the species.
- Birds are great, but Jaguars are more fascinating by several orders of magnitude.
- Maybe a comparison with a female House Sparrow isn't fair, but you get the point.
- Jack along the Rio Cuiabá.



Jaguar portrait - 2008

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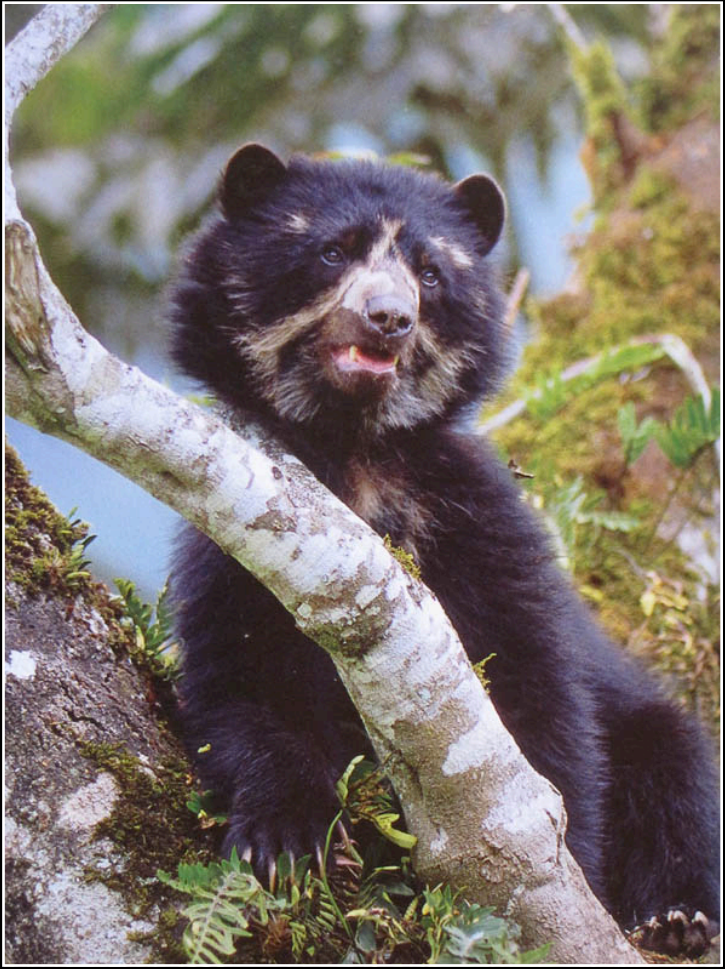
- We continued to the Brazilian Pantanal in 2007, where we spent some time at the Jaguar Research Center....
- then we returned to the Jaguar Research Center 2009 so that I could spend more time watching and photographing the cats in their natural environment.
- This is one of my paintings and it was used as the logo for the Jaguar Research Center.



South American Coati
Raccoon Family
PROCYONIDAE



Jaguar
Cat Family
FELIDAE



Spectacled Bear
Bear Family
URSIDAE



Maned Wolf
Dog Family
FELIDAE



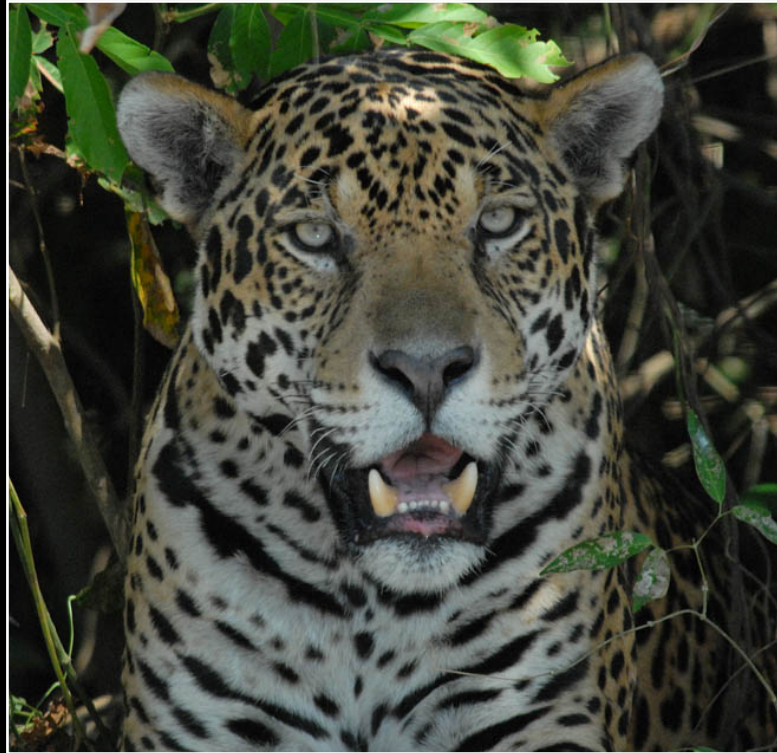
Giant Otter
Weasel Family
MUSTELIDAE

- Friday, December 17, 2010
- first a little introduction to Jaguars.....
 - Jaguars are members of the Felidae or cat family, in the order Carnivora, along with dogs, weasels, bears and raccoons.

Genus PANTHERA



Snow Leopard
Panthera uncia



Jaguar
Panthera onca



Leopard
Panthera pardus



Tiger
Panthera tigris



Lion
Panthera leo

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- The species is in the genus *Panthera*, along with Leopard, its closest relative, Snow Leopard, Tiger and Lion.
- It is the only living representative of the genus *Panthera* found in the New World.
- Do any of you use Macintosh computers? They still have Lion to go, but then they've pretty much exhausted the genus *Panthera* as names for their operating systems.

Leopard



Jaguar



Leopard versus Jaguar

- Leopards are only found in Africa and Asia, while Jaguars are only found in the Americas.
- Morphologically very similar to one another.
- Molecular studies show close relationship between the two species.
- The two species have interbred in captivity and produced fertile offspring.

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Many people confuse Jaguars and Leopards.

Leopard



Jaguar



Leopard versus Jaguar

- Limbs proportionately shorter on Jaguar.
- Jaguar stockier, heavier and more powerfully built.

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- In comparing the Leopard with the Jaguar, the Jaguar is a much stockier, heavier, more powerful cat and, unlike Leopards, does not climb trees very well.



Leopard

The black rosettes are larger and fewer in the Jaguar and these rosettes usually have black markings in the center.

Jaguar



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- One of the most obvious differences in appearance is the size and pattern of the groups of spots on the sides. The Jaguar's groups of spots, or "rosettes", are larger, more "exploded", and have small spots in the middle.



Leopard

Both species are capable of climbing trees, but the Leopard is a much better climber and is much more arboreal than the Jaguar.

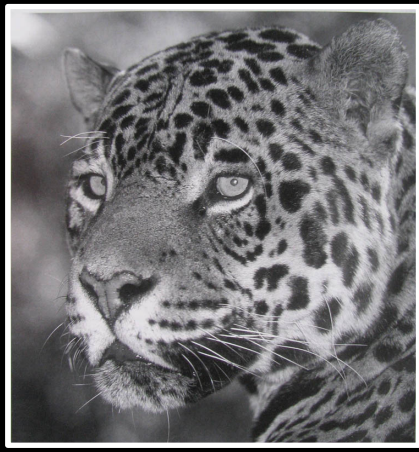


Jaguar

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Adult Jaguars rarely climb whereas Leopards spend a great deal of their time up in trees and even haul their prey up into trees.

Jaguar Distribution



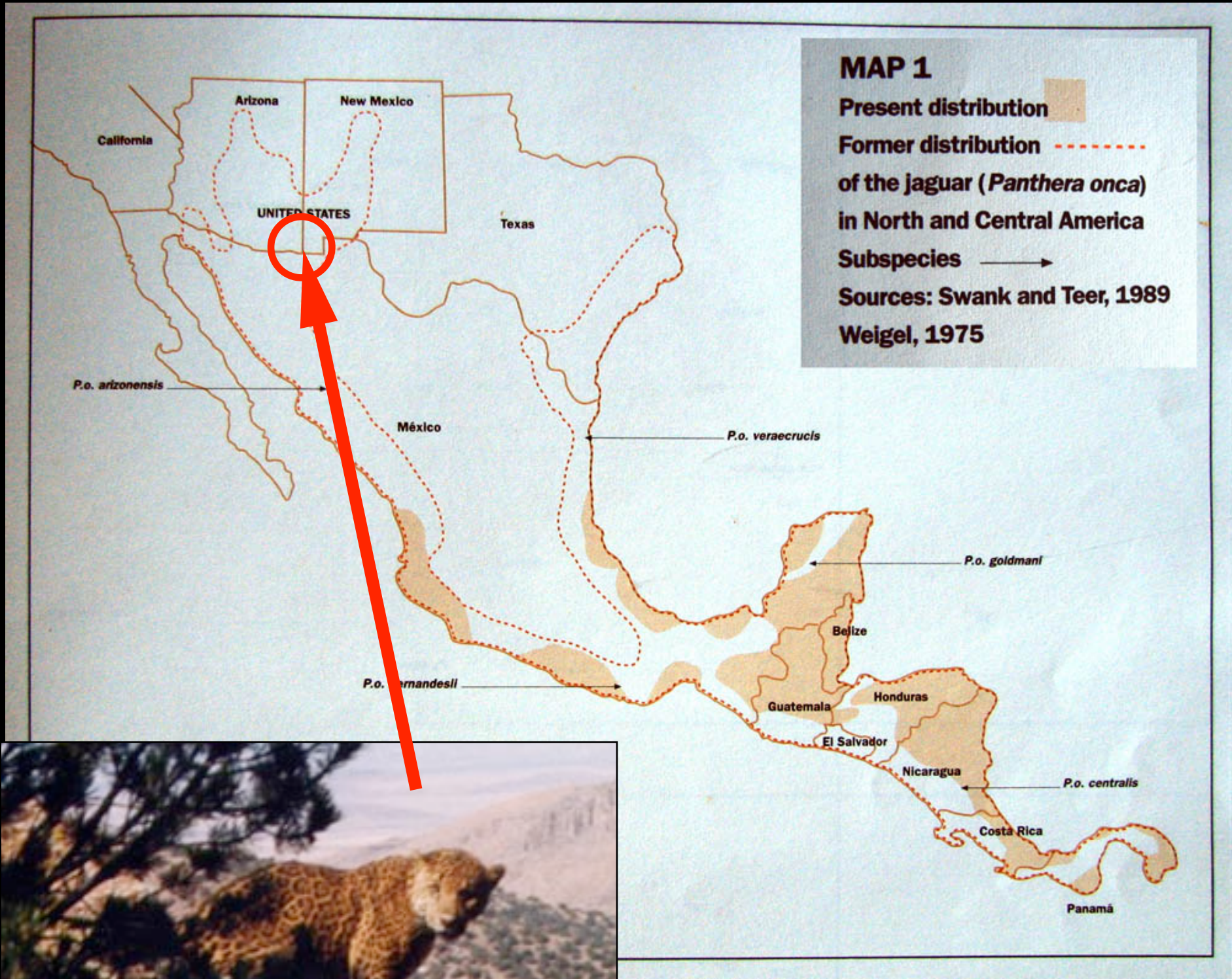
- Northern distribution historically to Oregon and Pennsylvania in USA.
- Since 1996 there have been sightings in southern Arizona and New Mexico.
- It's range has shrunk from 15 million square kilometers to 9 million square kilometers since European colonization.
- Tropical and subtropical habitats, generally up to 1,200 meters elevation.



Historic distribution from
Mexico southward

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- Five thousand years ago, the Jaguar occurred as far north as the middle of the U.S., with its range extending from Oregon to Pennsylvania.
- The historical range of the jaguar extended from Arizona, New Mexico and Texas in the United States south to either the Río Negro (40°S) or Río Santa Cruz (50°S) in Argentina (Arra 1974, Carman 1984).
- Since then, its range has shrunk by 40%, entirely due to persecution by hunters.
- Formerly occupied habitat in the north of its range included oak woodland, mesquite thickets and riparian forests (Brown 1991).
- In the north, the jaguar's range has receded southward about 1,000 km, and has been reduced in area by about 67%.
- Swank estimates its range has shrunk from 15 million square kilometers to 9 million square kilometers since European colonization.



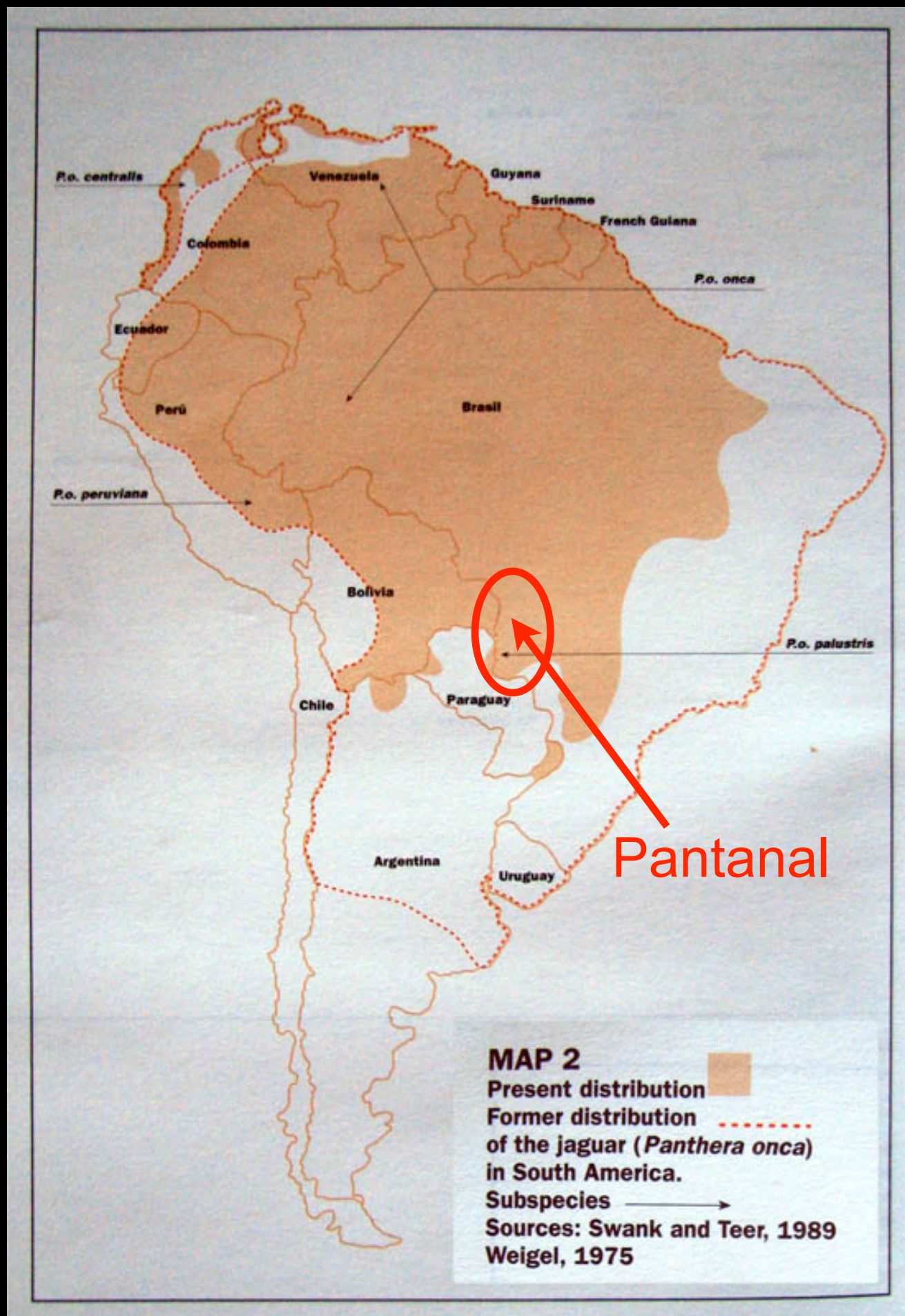
Former and
 present
 distribution of
 the Jaguar in
 Middle America.



Peloncillo Mountains
 New Mexico
 7 March 1996

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- In 1965 the last legally killed jaguar in the U.S., a male, was taken by a deer hunter in the Patagonia Mountains, south of Tucson, Arizona.
- During the next 21 years, only two jaguars were documented in the United States, both killed: a large male shot in 1971 near the Santa Cruz River in Arizona by two teenage duck hunters, and another male cornered by hounds in the Dos Cabezas Mountains in Arizona in 1986.
- Jaguars were thought to be gone from the U.S. southwest until Warner Glenn, a cattle rancher and mountain lion hunter, saw and photographed a live one in the Peloncillo Mountains, near the New Mexico border with Mexico, on March 7, 1996.
- Now a few brave animals enter southeast Arizona and southwest New Mexico from their main territories in extreme northern Mexico.
- A male Jaguar was radio-collared SW of Tucson, the first in the U.S., on 18 February 2009.....he was recaptured and euthanized 12 days later due to advanced kidney failure, perhaps due in part to stress from the original capture.
- map from *The Jaguar* by Rafael Hoogesteijn and Edgardo Mondolfi, 1992, Armitano Publishers (Armitano Editores C.A.)



Former and present
 distribution of the
 Jaguar in South
 America.

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- In South America, the Jaguar's range has receded northward by well over 1,000 km. in the last 50 years and has been reduced by about 38% (Swank and Teer 1987).
- While they are generally found at considerably lower elevations, there are records of tracks up to 2100 meters (6900 feet) in the Andes of Perú, and up to 2700 meters (8860 feet) in the Andes of Bolivia.
- photo of Wilson, Rio Cuiabá, 07 June 2009.
- map from *The Jaguar* by Rafael Hoogesteijn and Edgardo Mondolfi, 1992, Armitano Publishers (Armitano Editores C.A.

THE PANTANAL



Seasonally flooded grassland and woodland along the Rio Tres Irmãos.

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We were working in the Pantanal.....

Rio Tres Irmãos – 01 July 2007

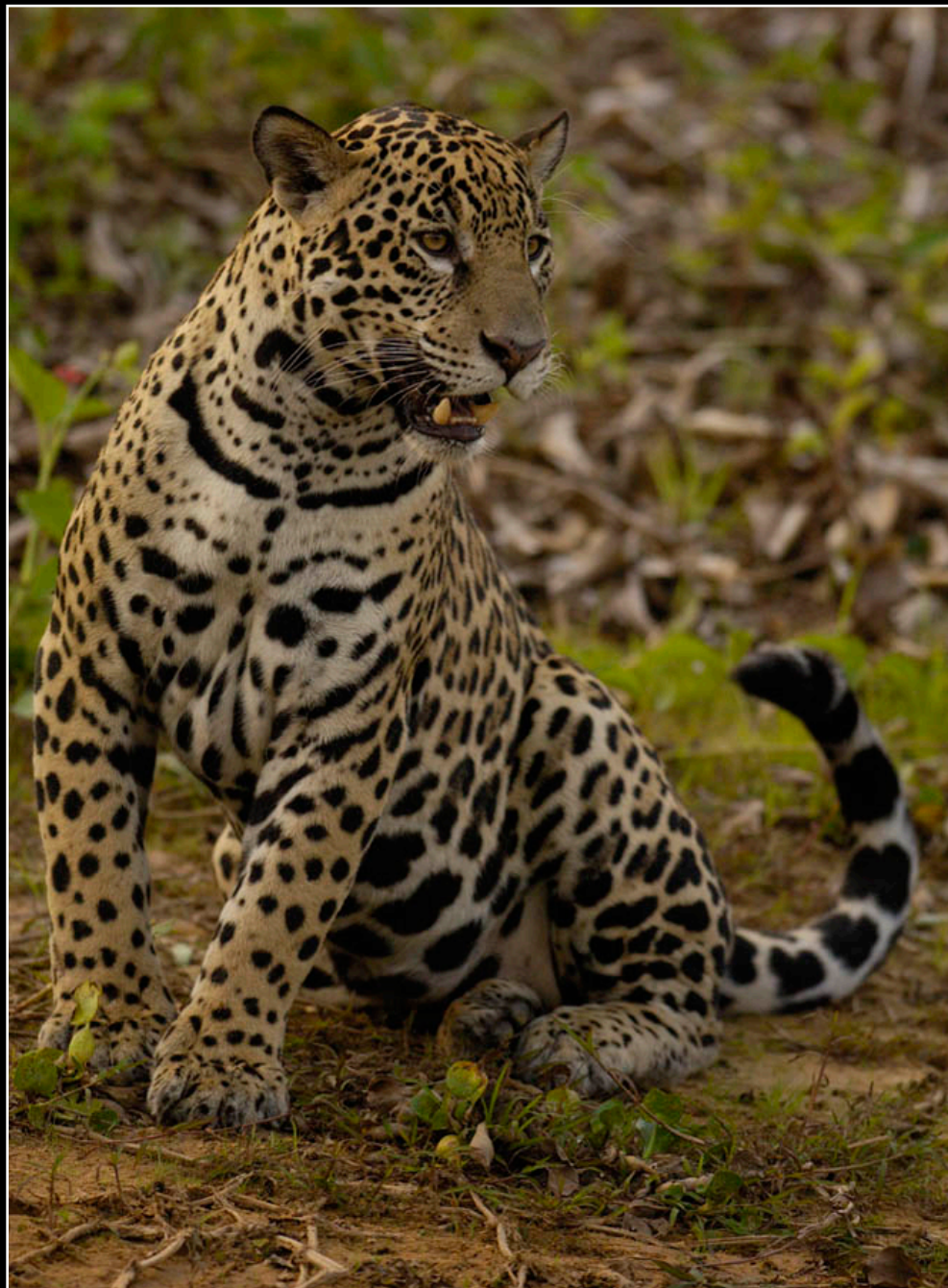


Pantanal wetlands of Mato Grosso state, Brazil

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-the largest seasonally flooded wetland area in the world.
- Wet season flooding is the major ecological influence on the Pantanal region.
- During this time, much of the open forest and grassland habitat is under more than a meter of water.
- Rio Tres Irmãos - 01 July 2007

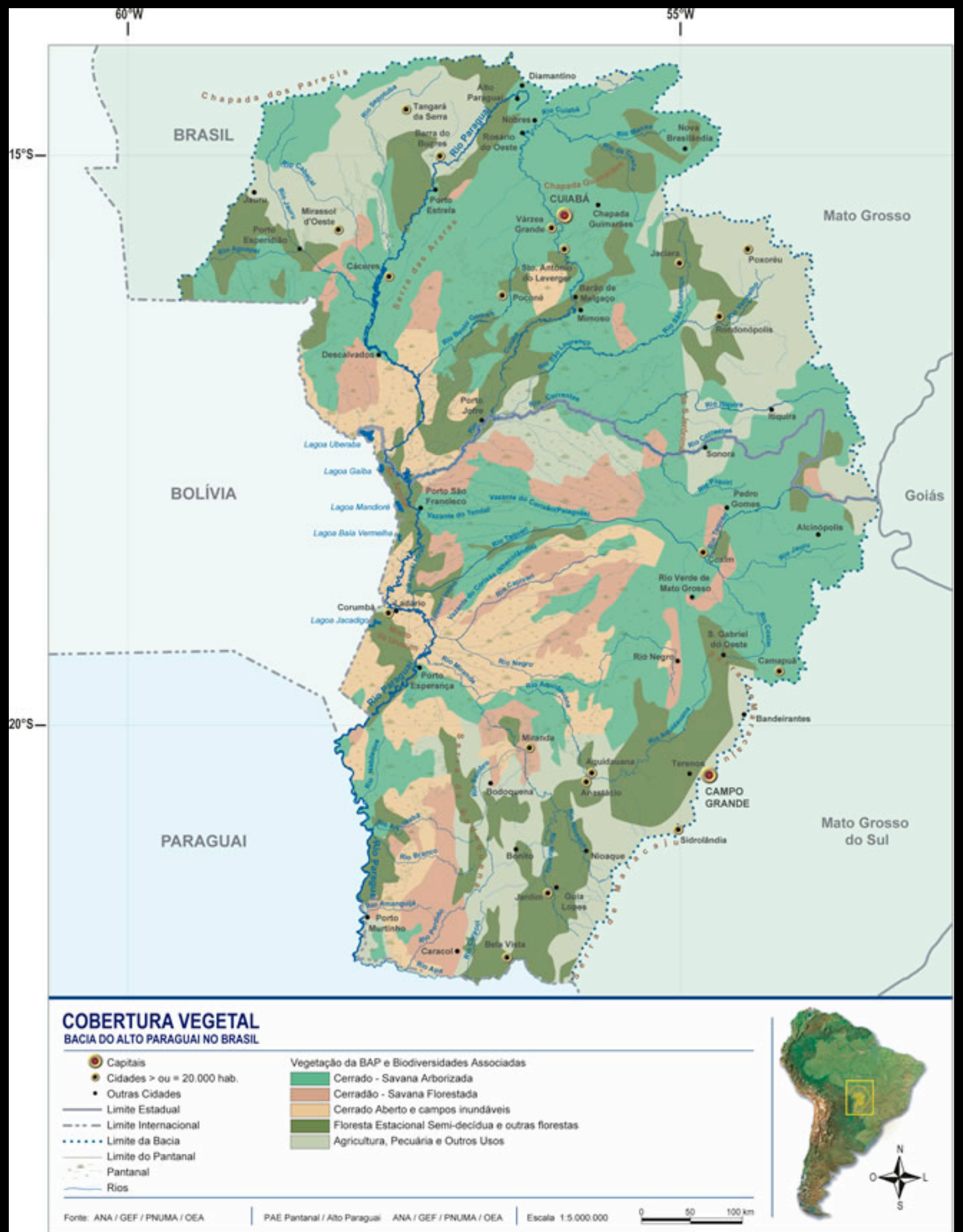
The general location of the Pantanal is outlined in red.



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- You can see that the Pantanal is located in southwestern Brazil in the states of Mato Grosso and Mato Grosso do Sul, and in adjacent eastern Bolivia and northeastern Paraguay.
- About 80,000 square miles in size. ...roughly half the size of Germany or California.

The Pantanal is a vast mosaic of wetlands, grasslands and woodland.



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- This mosaic of seasonally flooded wetlands and woodland may represent optimal jaguar habitat.
- Jack along the Rio Cuiabá.



The Pantanal is a paradise for waterbirds, with....

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The Pantanal is an amazing place for anyone interested in observing or photographing nature.

Great Egrets by the mouth of the Corixo Negro.



14 species of herons and egrets...

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3 species of storks...



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6 species of ibises
and spoonbill...



5 species of kingfishers....



plus oddities like
Sunbittern, Southern
Screamer, & Wattled
Jacana.

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The Pantanal also has an abundance of large mammals....

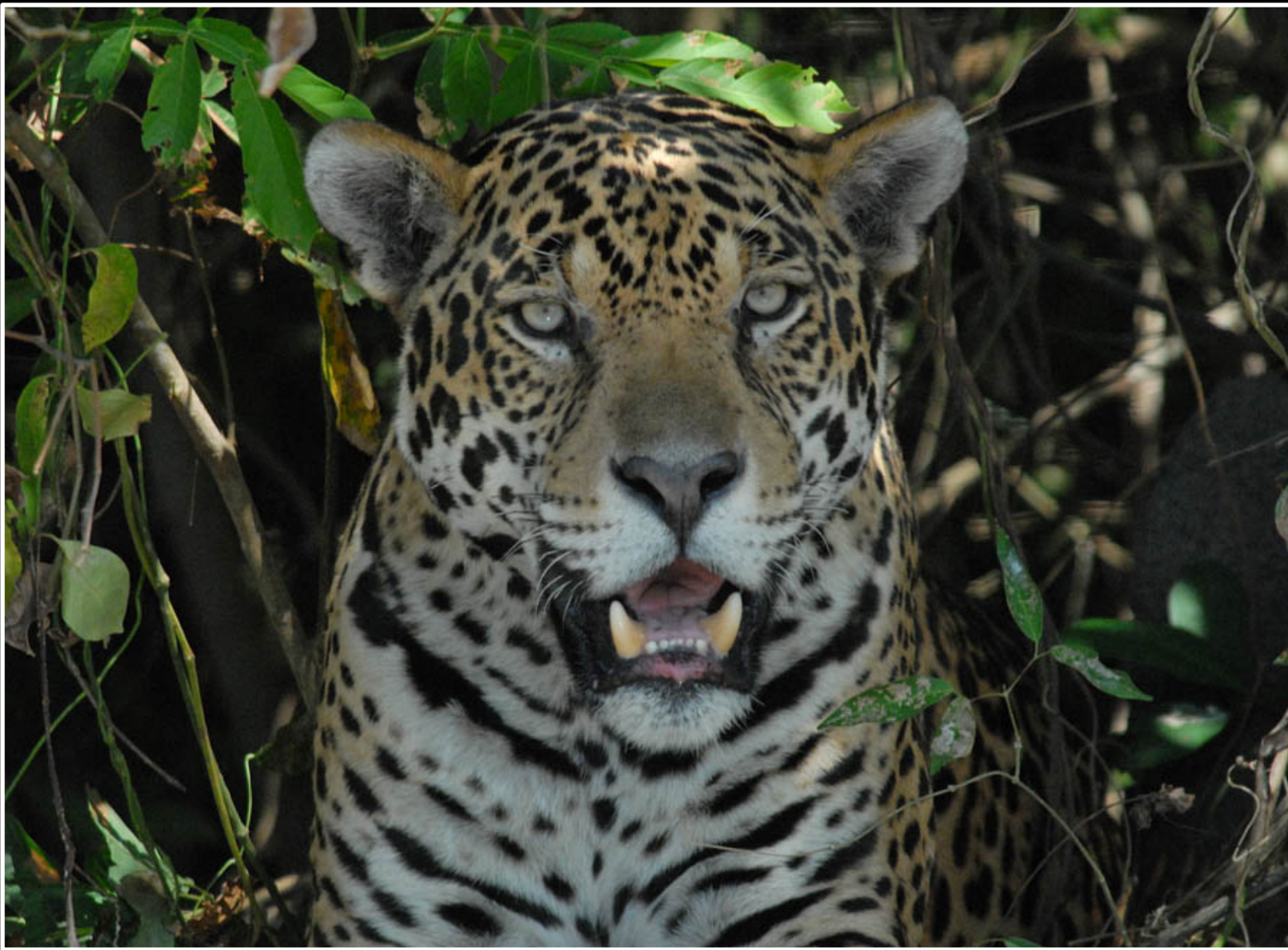
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including endangered species like Marsh Deer and Giant Otter.



...and an
abundance of
large reptiles.

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Jaguar is considered one of the flagship species of the Pantanal.

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- Along with Jabiru, Hyacinth Macaw and Jacaré or Paraguayan Caiman, the Jaguar is considered one of the flagship species of the Pantanal.
- As one of the flagship species or signature species of the Pantanal, the Jaguar can play an important role in ecotourism in the area.



Jaguar Research Center



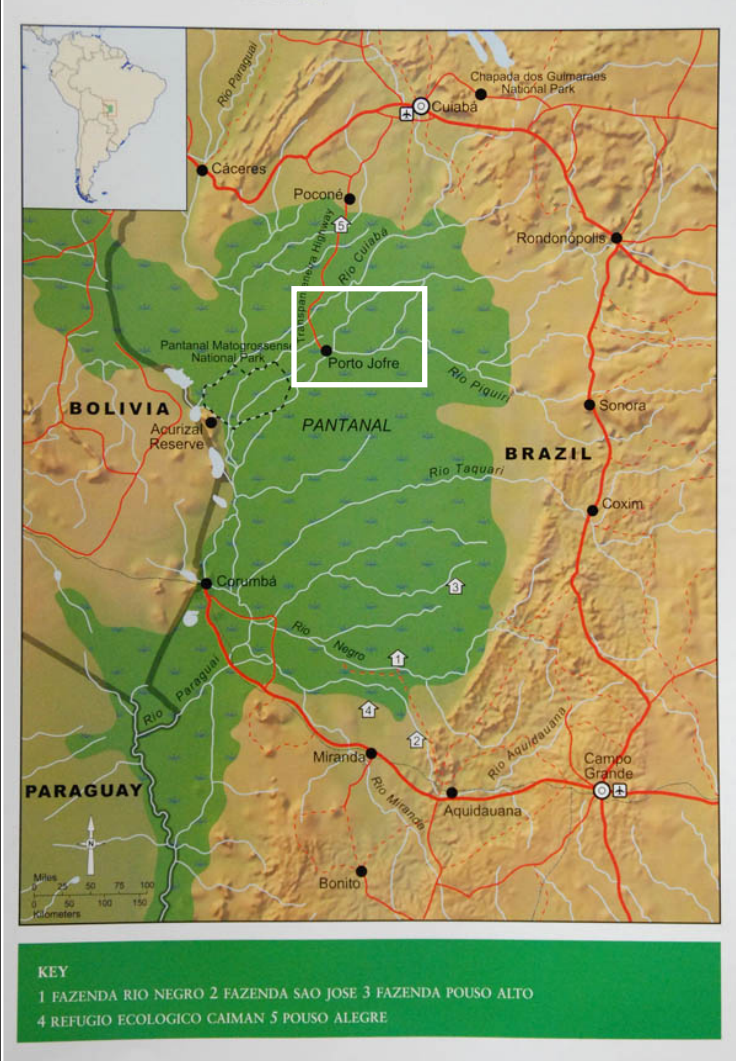
The Jaguar Research Center was established by Charles and Mariana Munn in 2007.



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- As I mentioned, we were working at the Jaguar Research Center.
- The purpose of the Jaguar Research Center is to
 1. monitor the Jaguar population of the area and...
 2. to demonstrate through ecotourism that Jaguars are worth more alive than dead.
- Charlie, a former macaw researcher, used to be a senior scientist with the Wildlife Conservation Society.
- Here's Charlie with Wilson, the most frequently seen Jaguar in the area.

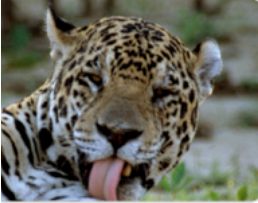
MAP OF THE PANTANAL



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- These maps shows where the Jaguar Research Center is in relation to the rest of the Pantanal.
- The camp is situated along the Rio Tres Irmãos or Three Brothers River.
- The Rio Tres Irmãos lies within the Parque Estadual Encontro das Aguas - or Meeting of the Waters State Park in English. The protection afforded by this park is one of the reasons we see so many Jaguars in this area.
- This 270,000 acre park is one of only three large protected areas in the Brazilian Pantanal.

2004



Leopard Piquiri 1

DATE:0904

ID: Leopard Piquiri 2


DATE: 0904

ID: Jan (♂)

DATE: 2005

Photographer: Jan Fleischmann,

2005



Leopard Piquiri 2

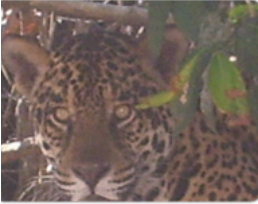
DATE:0904

ID: Jan (♂)

DATE: 2005

Photographer: Jan Fleischmann,

2006




DATE: 2006

Photographer: Mary Slater

ocation: Tres Irmaos

2006




DATE:2006

Photographs: Henry Pfenninger (Alysson)

ocation: Tres Irmaos



2006



DATE:2006

Photographer: By H. Pfenninger

ocation: Tres Irmaos area




ID: Henry & Henrietta

DATE:2006

2006: By H. Pfenninger

Location: Campo de Jofre

2007




2008

HUGO ♂

DATE: July 2007

08: 0908

ocation: Cuiaba River entre barras




2008

ID: GIA ♀

DATE: August 2007

2008: 2606

Location: Rio Cuiaba/Porto




2008

ID: Mark (1/4)

DATE:0807

Location: R.Cuiaba/Sao Bento




2008

JULIA

DATE: 080807, 270708

ocation: Rio Cuiaba/Porto Jofre




2008

ID: Wilson

2008: 1707,2607,2707,3107, 0108,0608

Location: Tres Irmaos




2008

ID: CANELA ♀

0907


Location: R. Canela



ID: WALDO

0807


Location: Cuiaba upstream



ID: PETE

0807

Location: Cuiaba upstream

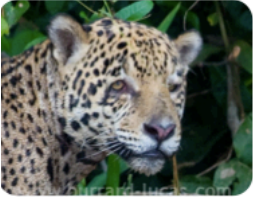


ID: Lilli

DATE:0707


Location: Cuiaba entre Barras

2008




VOVO ♂

0306




BORBOLETA ♀

0106,0608,0808



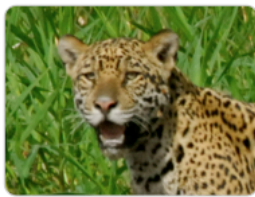
SILVIA ♂

2607




ESTELA ♀

2007,0608,0808, 1008




GEOFF ♂

0808,1008




ALEX

2507




HECTOR ♂

0908



PARIS ♀

1208

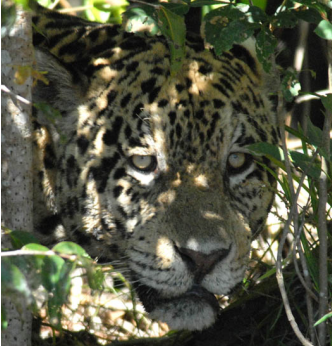


Jaspar ♀

1408

- Jaguar monitoring since 2004.
- 29 different individuals identified in the Rio Cuiabá-Rio Piquiri-Rio Tres Irmãos area

2009



Julian

Friday, December 17, 2010

Each year new individuals have been found in the study area.



Hector along the Rio Tres Irmãos.

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- Especially in the vicinity of JRC, not only is there a very dense Jaguar population, but they are relatively easy to locate and observe, especially in the later dry season.
- In 2007 observers saw an incredible 7 Jaguars in one day.
- In late August of this year guests who were at JRC for 3 nights had 13 observations of 8 different Jaguars, including two new individuals for the study, totaling 11 hours of Jaguar observation.
- This Jaguar is named Hector.
- All of the Jaguars in the JRC study have been given names.
- The rule is that whoever takes the first photo of a Jaguar not seen before gets to name it. The only request we make is that the name be easy to say in Portuguese, Spanish, German, and English.
- So far, all of the JRC Jaguars have been given harmless-sounding names....Geoff, Estella, Pollyanna, Flora, and Hugo. However, when you see these enormous, fierce-looking, very scary cats up close, it might seem much more appropriate to name them Slash, Killer, Ripper, Jaws, and Fang.



The *Pira Miuna* - headquarters of JRC

Friday, December 17, 2010

The *Pira Miuna* serves as the headquarters, kitchen, and dining hall for JRC.



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- The sleeping tents are located back inside the forest.
- This was our tent – before we trashed it with wet field clothes and muddy boots.



Patrolling the Corixo Negro for Jaguars.

Friday, December 17, 2010

- Our work, every day, consisted of going up and down, and up and down the rivers, scanning the river banks with binoculars for hours at a time.

Teresa, Edilene, and João along the Corixo Negro, 28 June 2009.



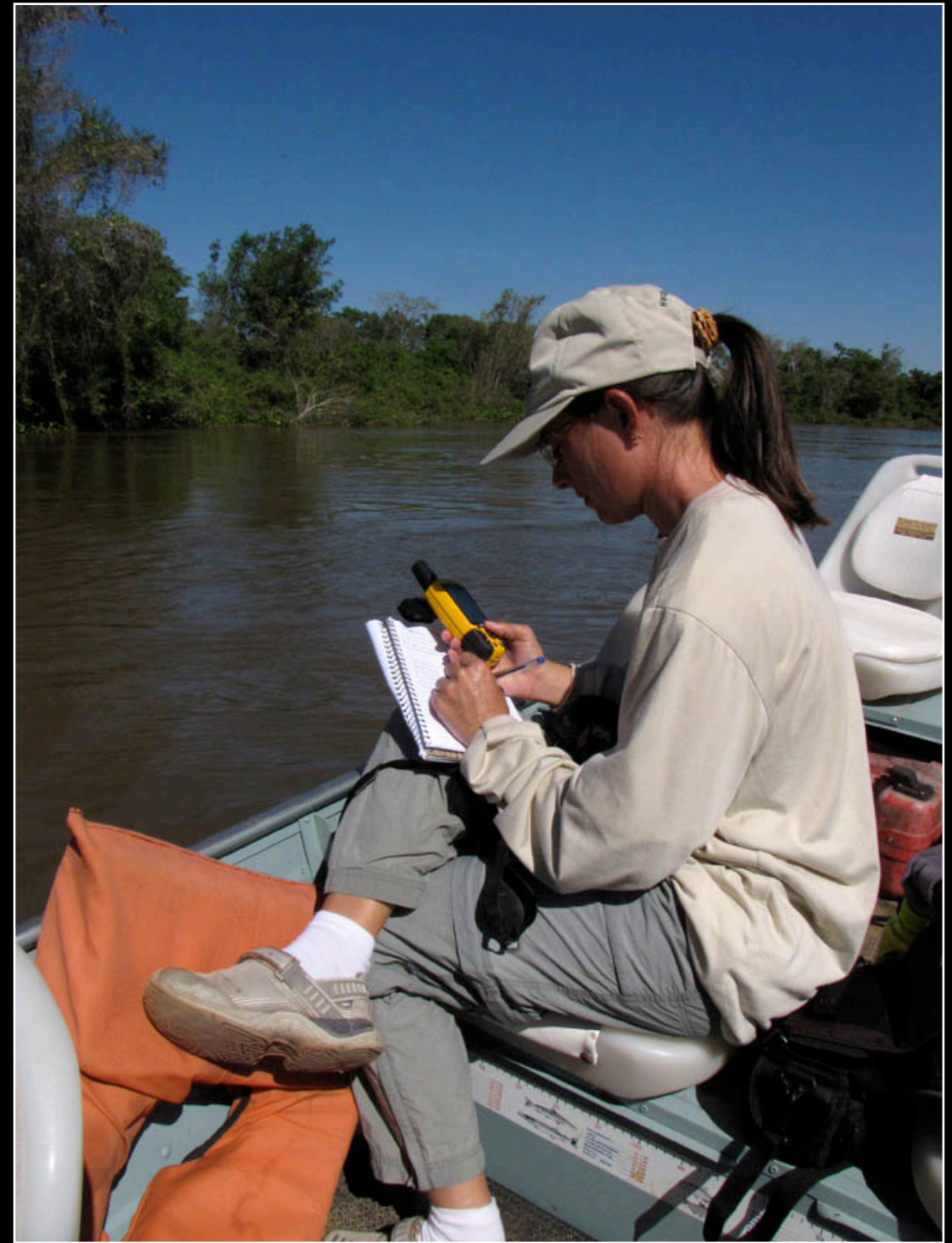
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The red circle shows our search area....indicate the important areas where you search for Jaguars.

The area searched regularly is about 23 kilometers or 14.5 miles across (Porto Jofre to Rio Cuiabá end of Caxiri, straight line distance).



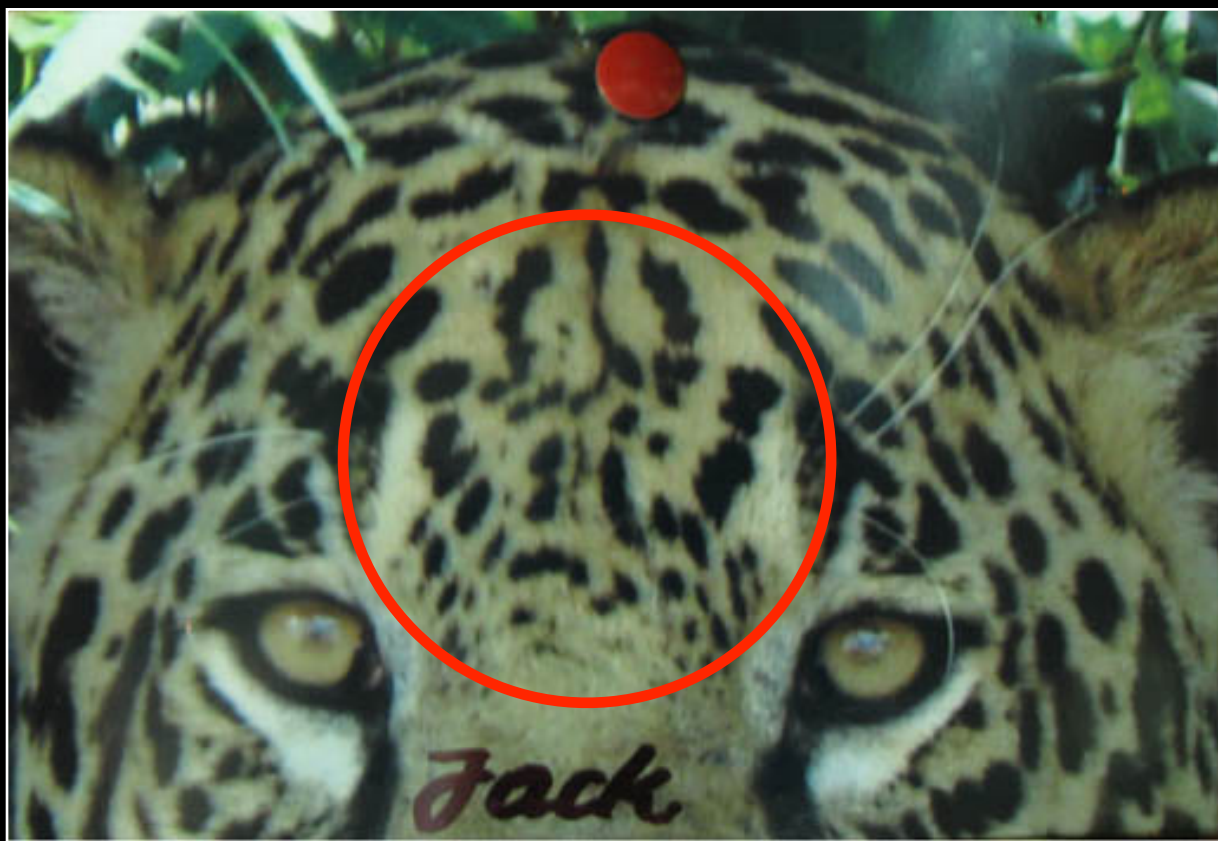
A tranquilized Jaguar in the Venezuelan llanos being fitted with a radio collar.



Recording with GPS the location of a Jaguar sighting.

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- Most other studies of Jaguars have relied on tranquilizing study animals and fitting them with radio collars.
- Radio-collaring is risky for the Jaguars.
- In the last seven years (as of fall 2009), biologists have captured four jaguars in the Arizona-Sonora region of southern Arizona and northern Mexico, in each case intending to put a radio collar on the animal. Three of those Jaguars have died as a result of the darting or collaring.
- Another radio-collaring study in the Brazilian Pantanal has recently killed two Jaguars....
- ...and another radio-collaring study in southeastern Perú has killed several Jaguars.
- In the case of the Jaguar Research Center's study, collaring has been unnecessary. Except for the months of highest water, when the Jaguars disappear for parts yet unknown, they can easily observe Jaguars in their preferred riverbank habitat.



Distinctive face patterns of four of the Jaguars in the JRC study....Jack, Magali, Lara and Estela.

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We know 27 Jaguars individually by the spots around and especially BETWEEN their eyes.

The entire spot pattern is different between individuals, like fingerprints, but because the Jaguars are usually facing observers, the spots between the eyes are the easiest to use for identification.

These spots are generally in the form of some variation of the letter W.



The post office wanted posters aboard the *Pira Miuna*.

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Patrolling the Rio Tres Irmãos for Jaguars.

Friday, December 17, 2010

Jaguars can be hard to spot, so it helps to use binoculars to scan the river banks.

Teresa, Edilene, and João along the Rio Tres Irmãos, downstream of Jaguar Research Center, 28 June 2009.



Wilson along the Rio Cuiabá.

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Crouched down in the riverside vegetation like this, Jaguars can be hard to spot.

Wilson along the Rio Cuiabá, 26 June 2009.



Jaguars can be hard to spot.

Friday, December 17, 2010

Wilson along the Rio Cuiabá – morning of 09 July 2009.

Jaguars can be VERY
hard to spot.



Jaguar along
the
Rio Cuiabá



Friday, December 17, 2010

Wilson – morning of 11 July 2009.



Jaguars can be VERY, VERY hard to spot.

Friday, December 17, 2010

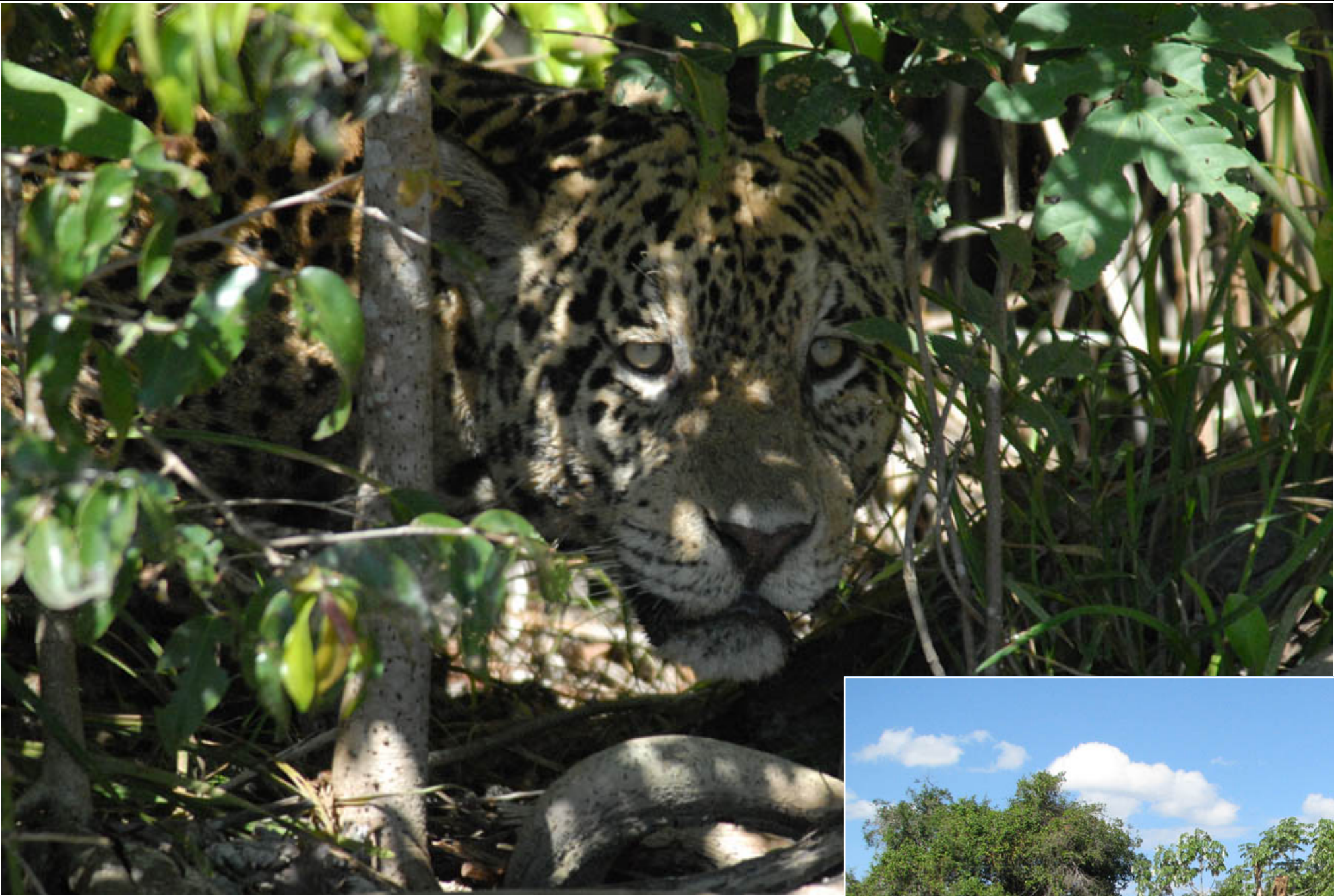
- When hiding in the river edge vegetation, they can be VERY, VERY hard to spot!
- They can see out through the vegetation, but we can't see in. It's analogous to looking through a peep-hole from up close or from across the room.
- Wilson's hiding behind these river edge vines. Just a bit of his rosette pattern can be seen.
- Infrared heat-sensing equipment would probably be a big help to locating Jaguars.
- Wilson's hiding spot along the Rio Cuiabá, morning of 28 June 2009.



“Wilson’s bank” along the Rio Cuiabá

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- The arrows indicates spots where we find Wilson, typical Jaguar resting spots along the river banks.
- The Jaguars are often partially or completely screened by vines and other vegetation.



Julian
along
the Rio
Tres
Irmãos

Their camouflage
works best in dappled
sunlight.



Friday, December 17, 2010
Lying in the shade, with the dappled light of the river bank, their pattern of black rosettes provides nearly perfect camouflage, and they can be VERY hard to spot.
Julian along the Rio Tres Irmãos – late morning of 05 June 2009.



Jaguar along the Rio Cuiabá

Friday, December 17, 2010

Lying in the shade, with the dappled light of the river bank, their pattern of black rosettes provides nearly perfect camouflage, and they can be VERY hard to spot.

Wilson's hiding spot along the Rio Cuiabá, afternoon of 28 June 2009.



Jaguar along
the
Rio Cuiabá

Friday, December 17, 2010

Wilson – afternoon of 03 July 2009.



Borboleta along the Rio Tres Irmãos

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Here are a couple of other typical places where we spot Jaguars.....

The arrow indicates the spot where we found Borboleta on 27 June 2009.



Paris along the Rio Tres Irmãos

Friday, December 17, 2010
The arrow indicates the spot where we found Paris on 01 July 2007.



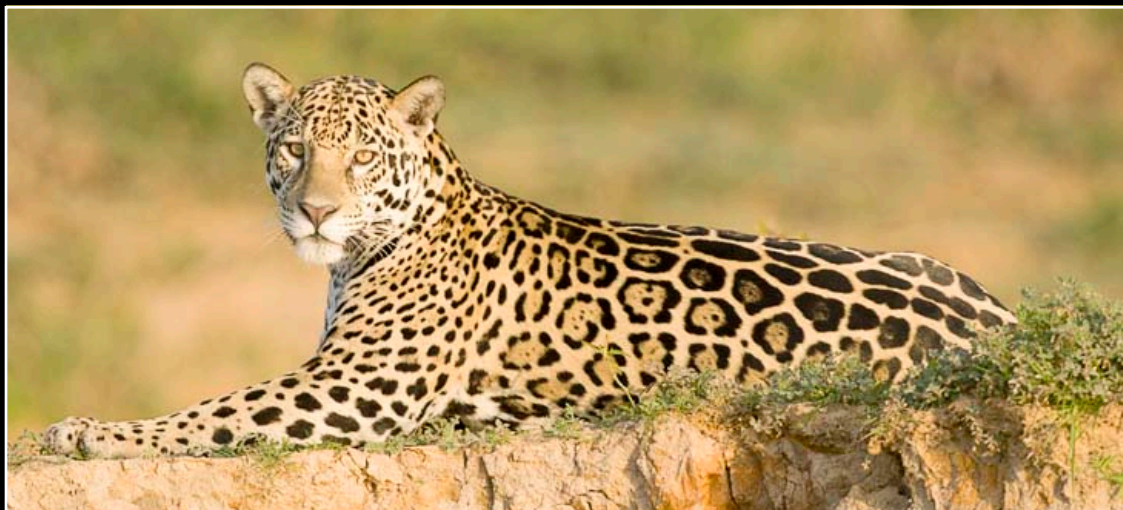
Sometimes other animals can tip you off to the presence of a Jaguar.

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- This very alert family group of three Capybara (*Hydrochaeris hydrochaeris*) along the Rio Tres Irmãos made loud alarm barks shortly after we passed them in the boat. We thought they might have been startled by a Jaguar.
- Though generally not disturbed by people or boats, they frequently give that call when frightened by a Jaguar.
- However, despite lots of scanning, we were not able to spot anything that might have frightened the animals.

Rio Tres Irmãos above Jaguar Research Center, afternoon of 01 July 2009

The boats are linked by two-way radios, so if one boat encounters a Jaguar, the other boats can be directed to the spot.



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João on the radio, Rio Tres Irmãos, 30 June 2009.

Pollyana on a river bank.



Spotting Giant Otters along the Corixo Negro.

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Other interesting sightings are also radioed back to the tourist boat. Here Edilene is reporting a family of Giant Otters.

Teresa and Edilene along the Corixo Negro, afternoon of 02 July 2009.



The length of the Jaguar observations varies widely, from less than a minute to more than nine hours.

The average observation lasts just over one hour.

The median observation lasts 30 minutes.

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The shortest observations last a minute or less, and the longest observation in 2008 was six hours. This season we have already had an observation lasting nine hours.

Based on 102 sightings during the period of July through December 2008 when the length of the observation was noted, the average observation lasted just over one hour (60.07 minutes).

The median observation length for that period was 30 minutes (half of the sightings were shorter, half were longer).

photo of Wilson, Rio Cuiabá, 07 June 2009.

When we find a
Jaguar that is
staying put, we drop
the anchor over the
side of the boat.



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Fabiano Oliveira with boat anchor, Rio Cuiabá, 04 July 2009.



Like all cats, Jaguars spend a good deal of time each day grooming themselves.

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Occasionally we see the cats doing exciting things, but we spend lots of time watching them just resting and sleeping.
...afternoon of 28 June 2009.

Wilson along the Rio Cuiabá - 09 July 2009



Wilson sleeping along the Rio Cuiabá.

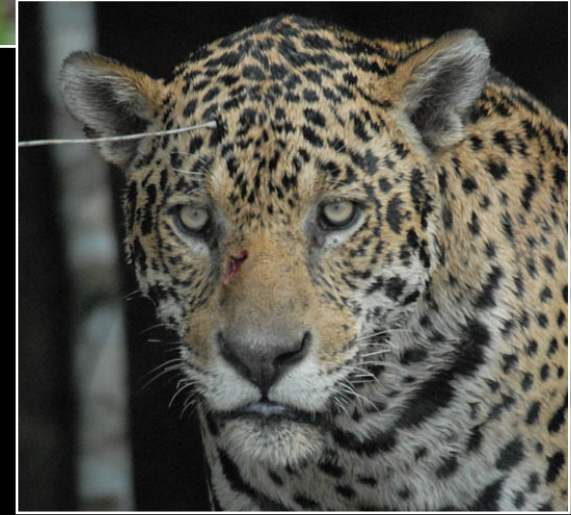
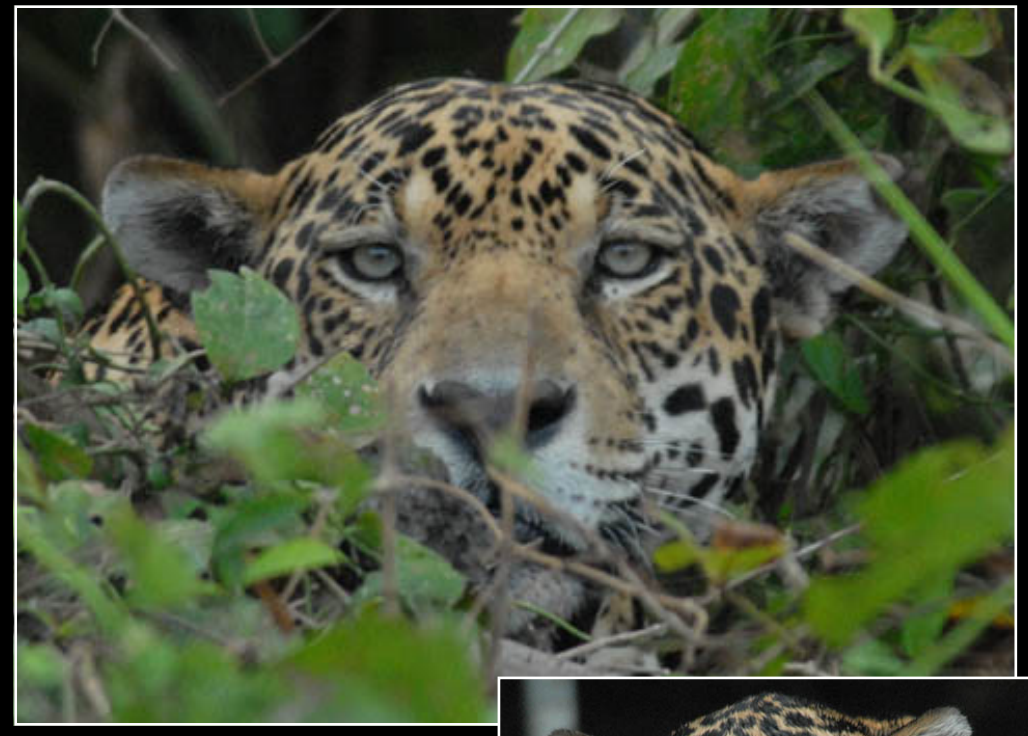
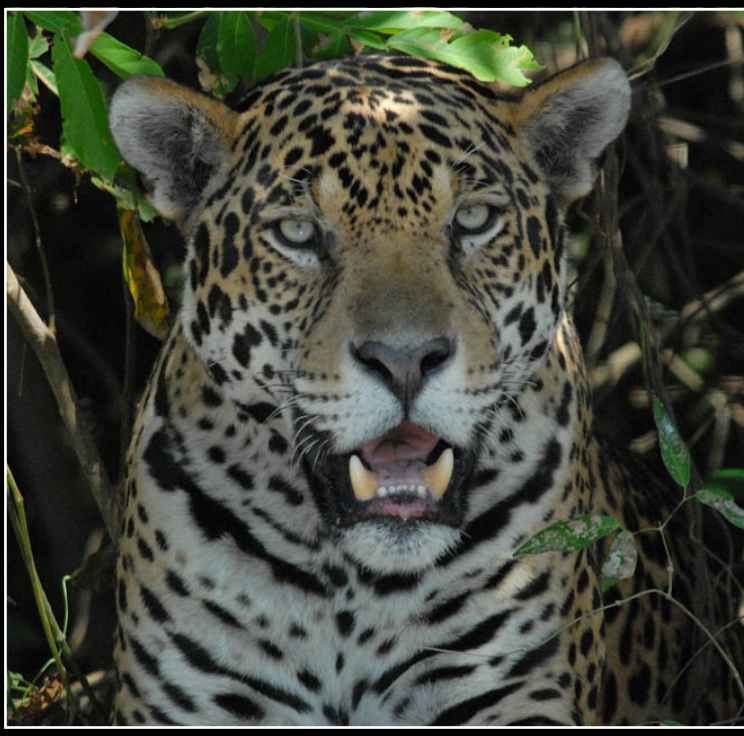
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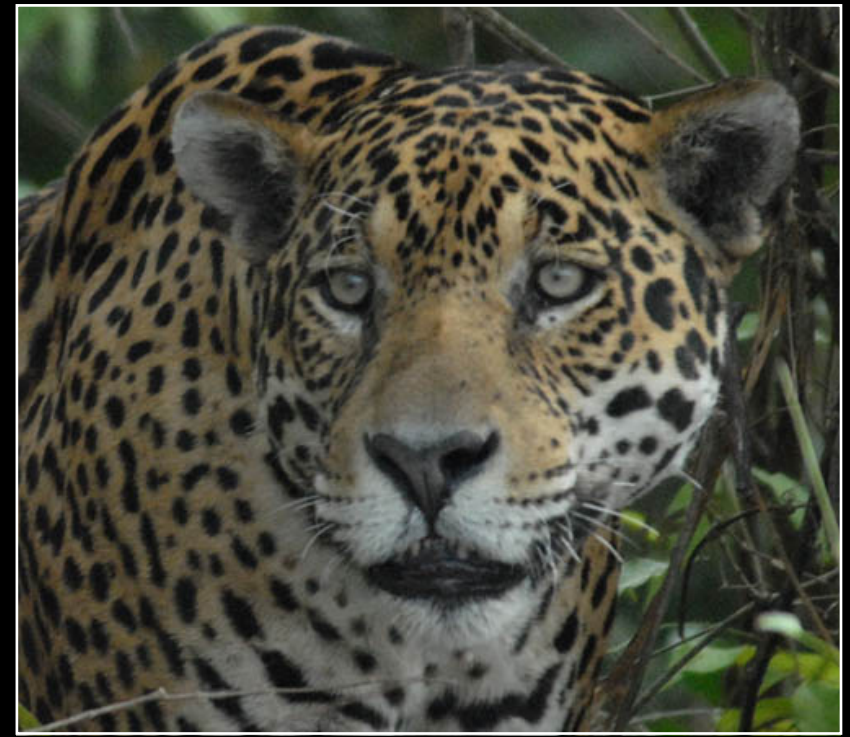
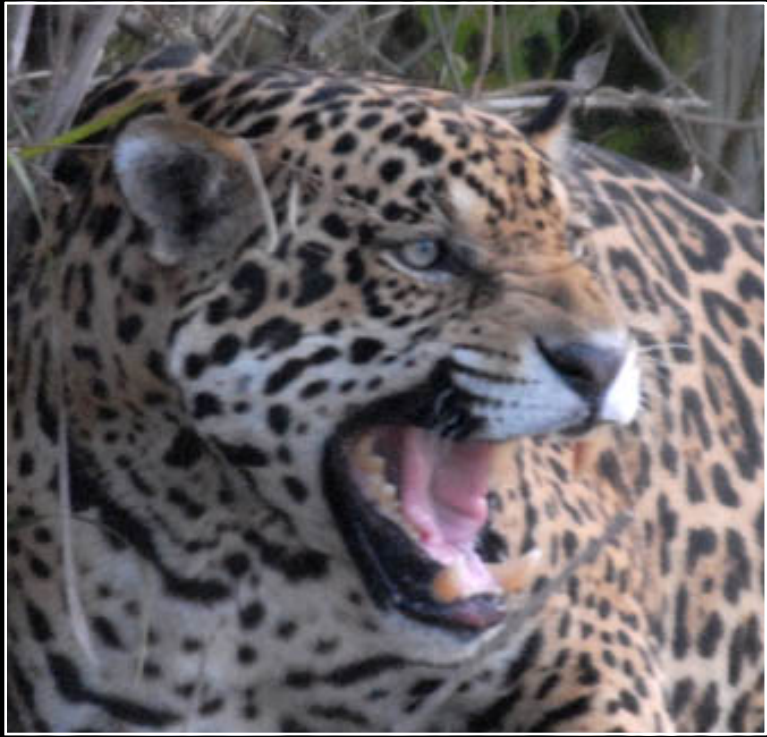


The Jaguars can be amazingly tolerant of visitors watching them at relatively close range.

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Wilson's changing facial expressions.



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- Except when they are sleeping, Jaguar facial expressions are always changing, so they are interesting even if they are not being particularly active.
- As with house cats, the position of the animal's ears signals its disposition.



Getting out to check for Jaguar tracks.

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While patrolling the rivers, we periodically got out on the river banks to check for Jaguar tracks.

Teresa, Edilene, and João along the Corixo São Pedrinho, 27 June 2009.



Examining fresh Jaguar tracks.

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While they were not yet able to identify individual Jaguars by their tracks, finding the tracks can still be useful. When you are not able to find the actual Jaguars, checking the river banks for tracks can give some idea of where they have been active.

Teresa, Edilene, and João along the Rio Tres Irmãos, 28 June 2009.



Making a plaster cast of a Jaguar track

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Edilene, in the gallery forest along the Rio Tres Irmãos, upstream of Jaguar Research Center, 27 June 2009.



Making a plaster cast of a Jaguar track

Friday, December 17, 2010

Francisco along the Rio Tres Irmãos, upstream of Jaguar Research Center, 01 July 2007.



River bank covered with Jaguar tracks

Friday, December 17, 2010

Getting out of the boat is always a little freaky because we almost always find Jaguar tracks, sometimes very fresh ones.

Rio Tres Irmãos – 01 July 2007



side branch of Corixo São Pedrinho

Friday, December 17, 2010

tell of Jaguar we came upon only 25 meters downstream of where we had been walking around.

side branch of Corixo São Pedrinho – 16 June 2009



Rookery along Rio Tres Irmãos - 10 June 2007

Friday, December 17, 2010

- In June 2007 a Jaguar was regularly passing along below an active rookery of Neotropic Cormorants, Anhingas, and White-necked Herons, eating the fallen fish scraps as well as any chicks or young birds that fell from the nests.
- Rio Tres Irmãos – 10 June 2007



Building the tree platform on the island.



Friday, December 17, 2010

We decided to construct a platform a platform in a tree along the route, hoping we would be able to observed the Jaguar when it passed.

me and Lourivan building the platform – 24 June 2007



Climbing to the tree
platform on the island.

Friday, December 17, 2010

Raimundo climbing to the platform, Teresa on the ground – 01 July 2007



Jaguars occasionally pass through the Jaguar Research Center camp, so there is a rule that you should never walk anywhere alone!

Friday, December 17, 2010

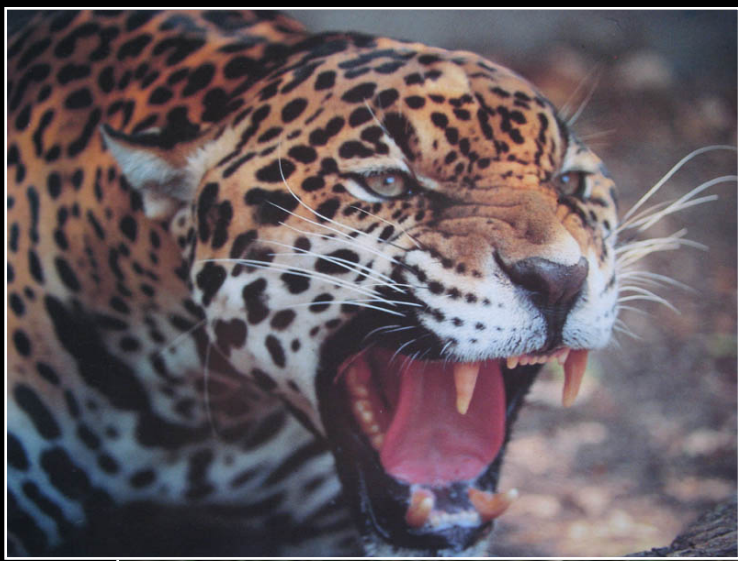
SO FAR, all the Jaguars encountered along the trails at the camp have turned around and gone the other way!



Machetes used by the staff when walking from the houseboat to the tents.

Friday, December 17, 2010

11 July 2009 aboard the *Pira Miuna*.



João and Teresa ready to meet a Jaguar along the trail.

Friday, December 17, 2010

Teresa and João - 11 July 2009, with tent #2 in the background.

JAGUAR BIOLOGY & NATURAL HISTORY



Friday, December 17, 2010

- Back to some Jaguar biology.....
- Wilson



- Home range in males: 28-40 square kilometers with extensive overlap.
- Home range in females: 10 square kilometers within the ranges of male jaguars.

Friday, December 17, 2010

- You can see the home range size of Jaguars. This is based on many radio collaring studies done over 20 years in most of the countries from Mexico to Argentina.
- As you can see, males have ranges that are three to four times larger than females.... Males home ranges include the home ranges of several females.
- The same pattern is found in the JRC study area with known individual Jaguars.... but without the use of any radio collars to track them.
- Crawshaw and Quigley (1991) found that mean daily travel distance was significantly larger for a male (3.3+1.8 km) than for females (1.8+2.5 km). Both sexes tended to travel further each day during the dry season.
- “punctuated movement”...Rabinowitz and Nottingham (1986) found that radio-collared male jaguars tended to remain within small areas (average 2.5 km²) for a week at a time before shifting in a single night to other parts of their range.....possibly related to kills they were still eating.....we saw same in vicinity of JRC
- In their Pantanal study, resident jaguar annual home ranges averaged 142 km² (n= four females, one male). The male’s home range was not larger than the females’. Female home ranges overlapped an average of 11.5% during the dry season, but not the wet. Mean wet season home range (13 km²) was significantly smaller than during the dry season due to extensive flooding; jaguars used only 4-13% of their total annual ranges during the wet (Crawshaw and Quigley 1991).
- photo of Wilson, Rio Cuiabá, 07 June 2009.



The Jaguar is one of the four roaring cats.

Friday, December 17, 2010

-along with Lion, Tiger and Leopard.
- The roaring is a means of proclaiming their territory.
- audio from *Neotropical Rainforest Mammals* by Louise Emmons
- Wilson – Rio Cuiabá – 04 July 2009



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The roaring or bellowing of the Jacaré or Paraguayan Caiman is often mistaken for the roaring of the Jaguar.

Friday, December 17, 2010

- Recorded 0048 hrs. on 11 July 2009 at Jaguar Research Center, Rio Tres Irmãos, Mato Grosso, Brazil



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Friday, December 17, 2010

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Friday, December 17, 2010

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In addition to roaring, and urinating or spraying, Jaguars will also proclaim their territories by making claw marks on specific trees.

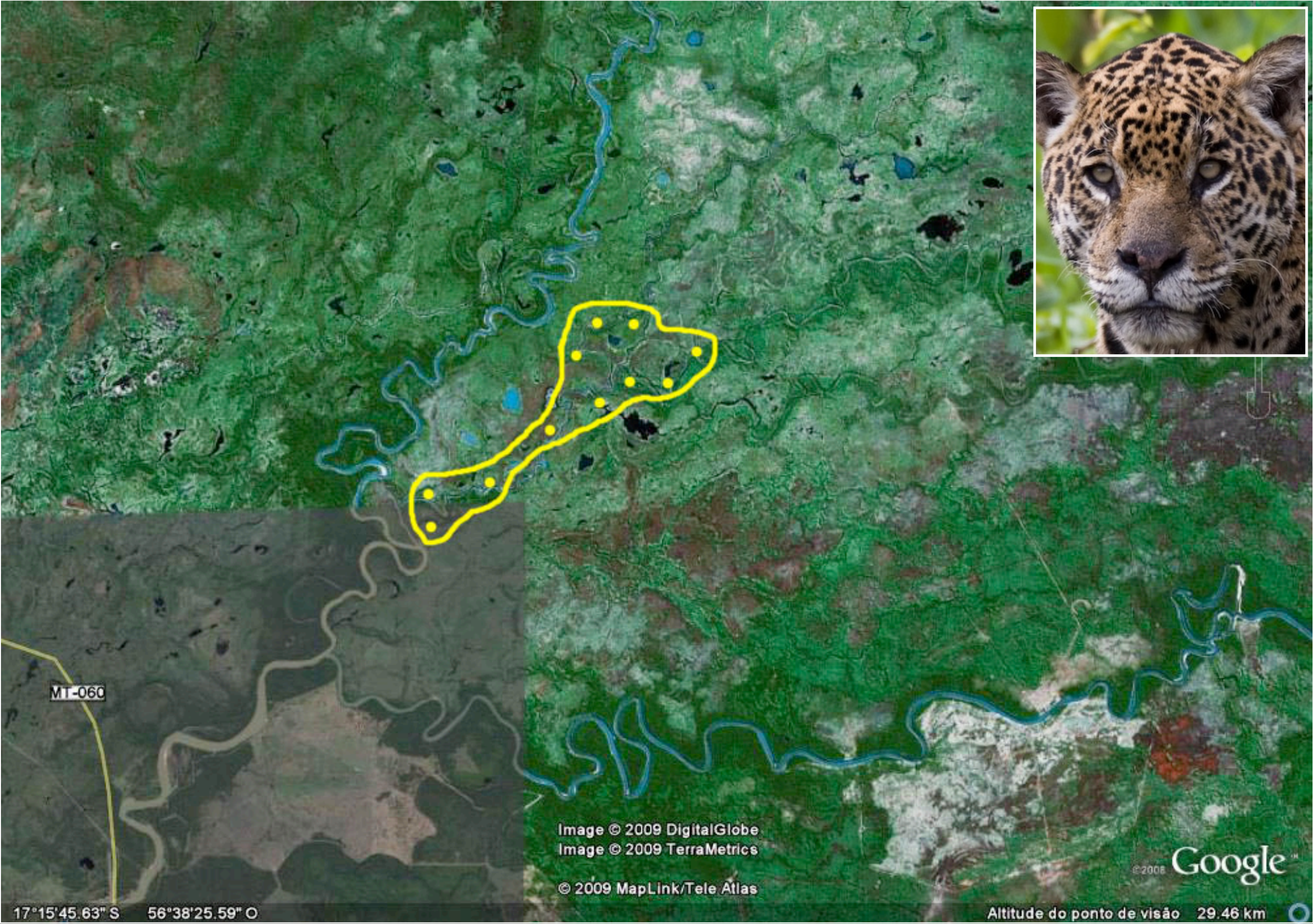
This behavior also serves to sharpen the cat's claws.



Friday, December 17, 2010

Like all cats, Jaguars mark their territories.

This Jaguar-marked tree is located in the gallery forest at Fazenda Santa Tereza in the northern Pantanal.
Francisco indicating claw marks – 2009 – photo by Teresa Wood.

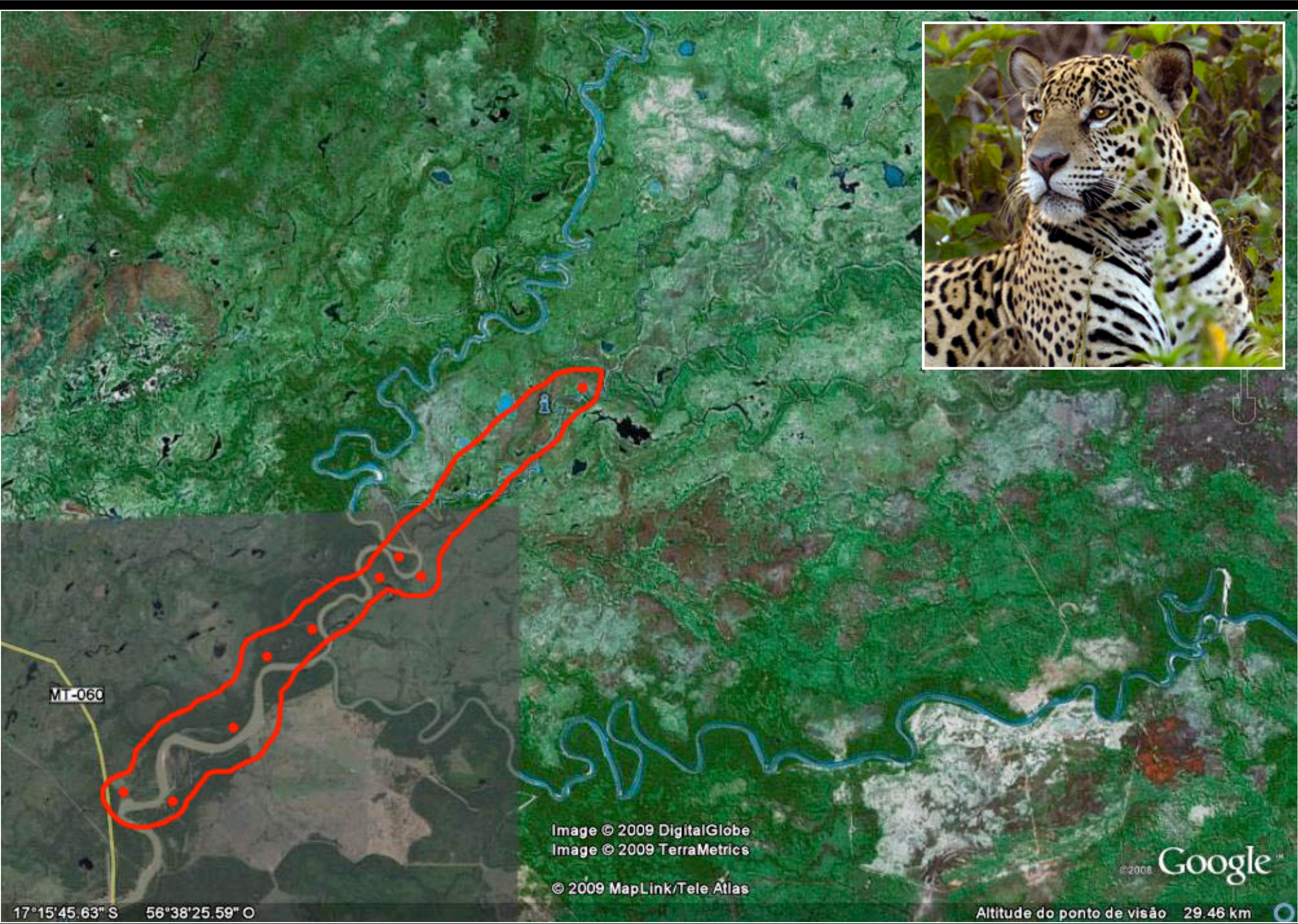
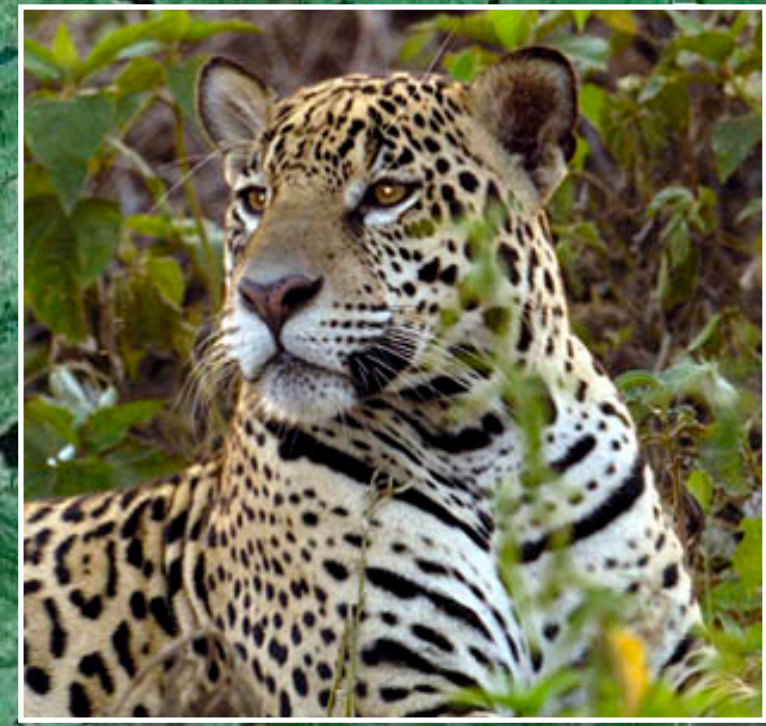


Borboleta

Friday, December 17, 2010



Wilson



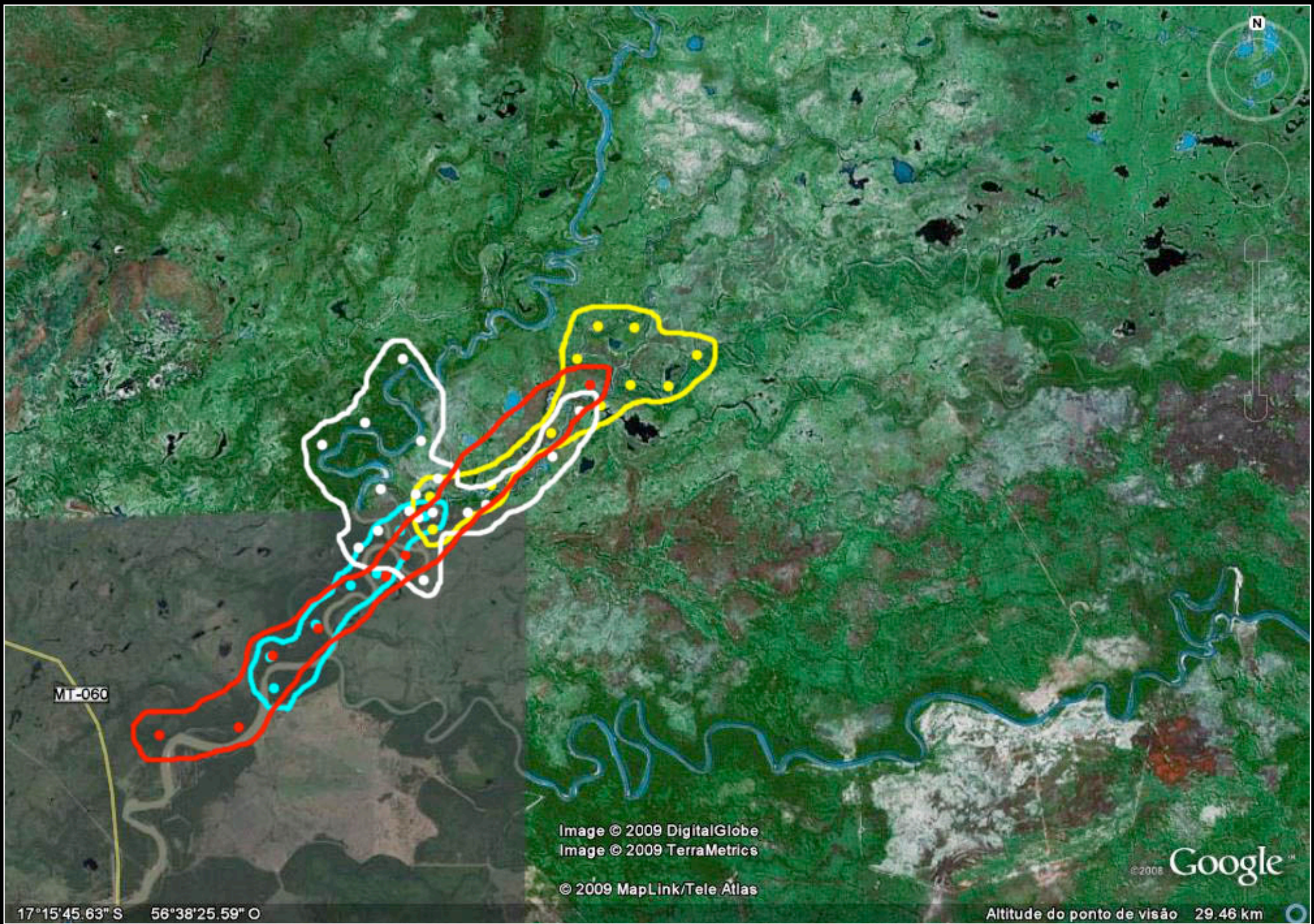
Jack

Friday, December 17, 2010



Hugo

Friday, December 17, 2010



Wilson-Borboleta-Jack-Hugo

Friday, December 17, 2010



Jaguar habitat in the Pantanal



Friday, December 17, 2010

- Jaguars are strongly associated with water....In the Pantanal, Jaguars are rarely found far from water.
- Jaguars are also very attached to forest, whether wet or dry.
- Studies of radio-collared Jaguars in the Pantanal have shown their preference for gallery forest (forest along watercourses) and forest patches. (Crawshaw & Quigley, 1991)



More Jaguar habitat in the Pantanal



Friday, December 17, 2010
tall “Cambara” forest along Corixo São Pedrinho



Jaguars love water and are excellent swimmers.

Friday, December 17, 2010

- Some, like Wilson, regularly cross even the fairly fast-moving Rio Cuiabá, a distance of about 125 meters.
- They are also quite fast swimmers. We saw one swimming only once, but were very impressed with its speed in the water.



They can also survive in drier habitats.

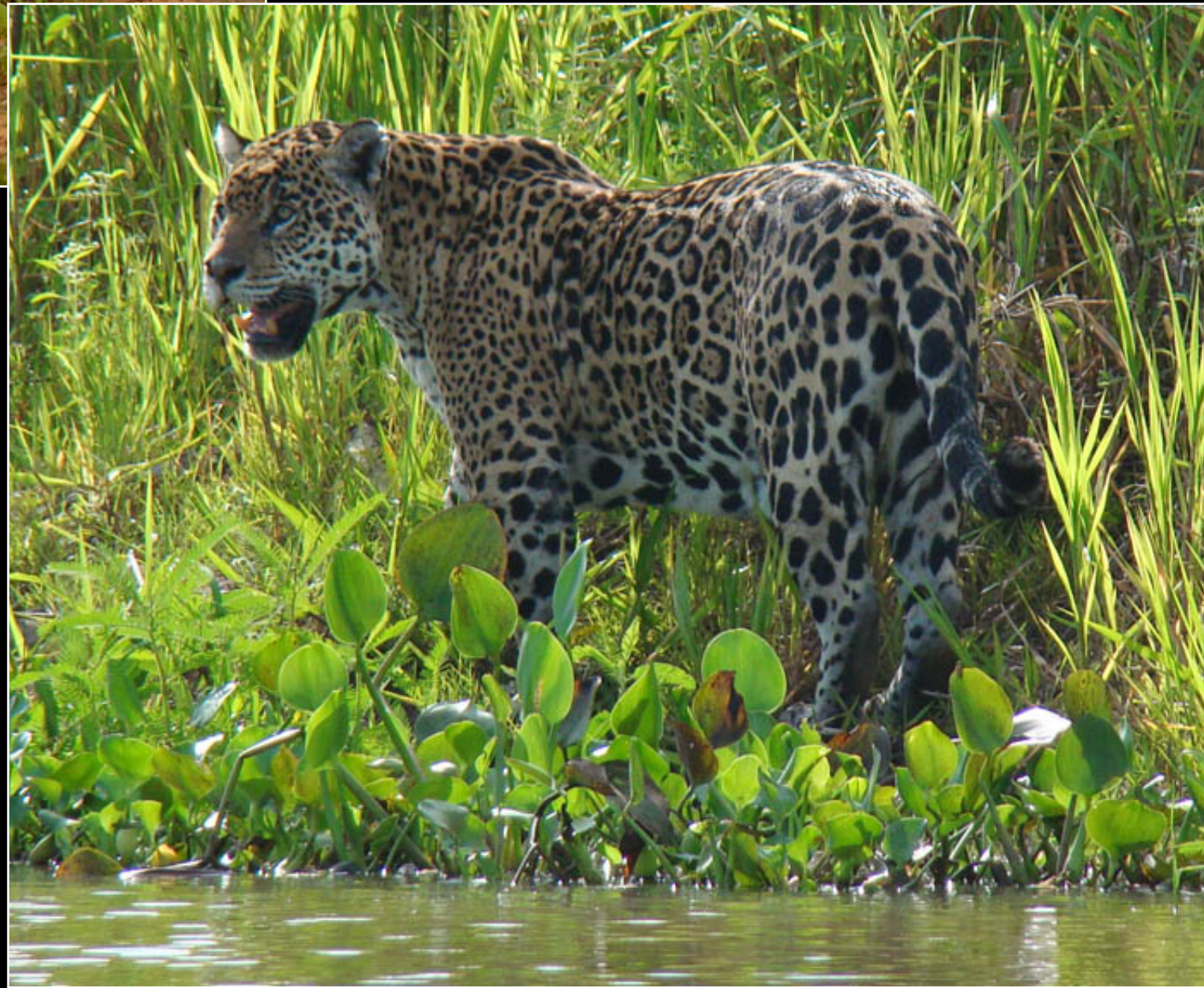
Friday, December 17, 2010

While they prefer the vicinity of water, in the extreme northern portion of their range – northern Mexico and into southern Arizona and New Mexico – they can be found in considerably drier habitats.



When not hunted,
Jaguars are
active by day and
by night.

In the vicinity of
the Rio Tres
Irmãos they are
very day-active
or diurnal.



Friday, December 17, 2010

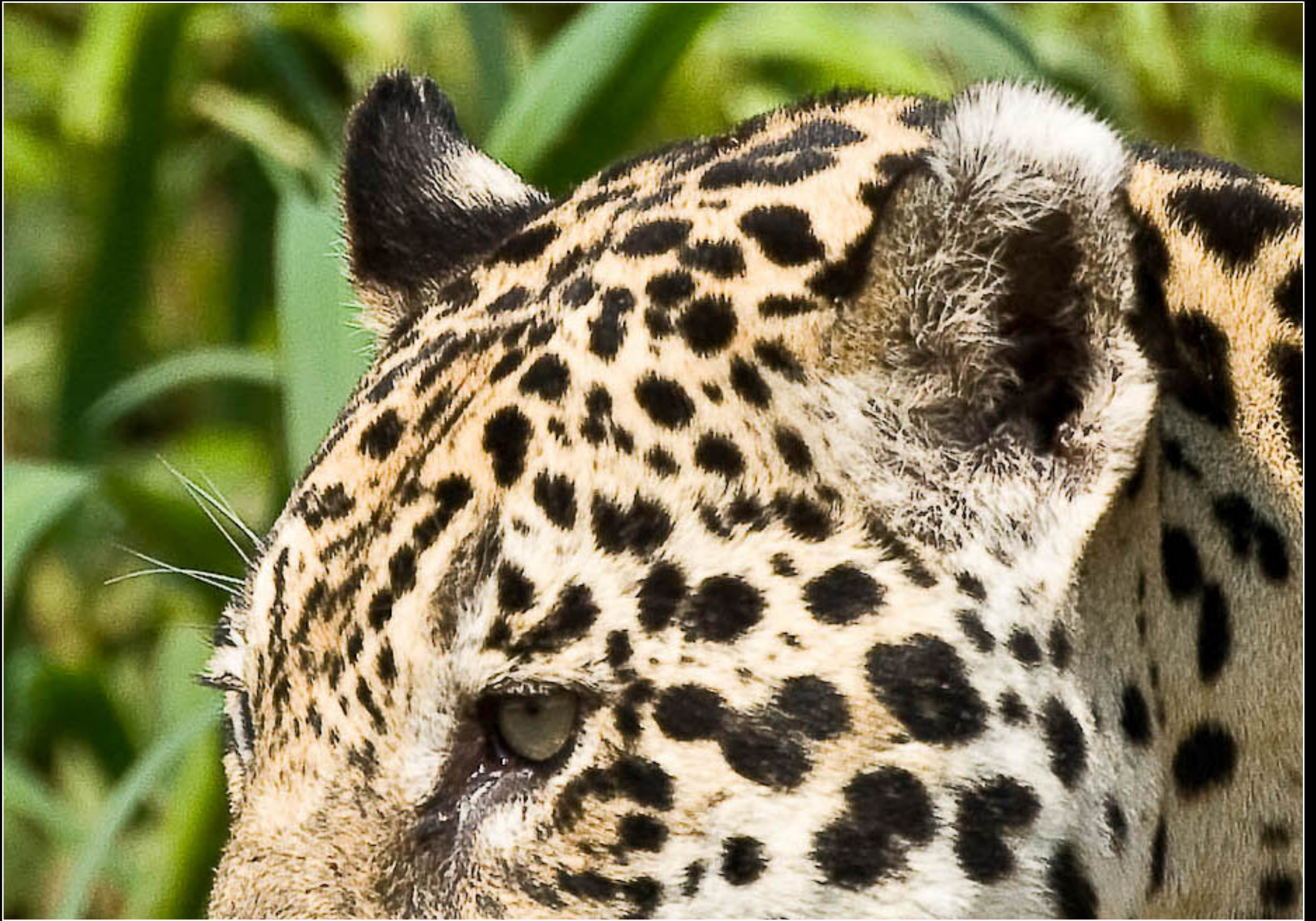
- Although the jaguar has been characterized as primarily nocturnal (e.g. Nowak and Paradiso 1983), radio-telemetry has shown that they are often active during the daytime, with activity peaks around dawn and dusk.
- Jaguars have been found to be active for 50-60% of each 24-hour period (Schaller and Crawshaw 1980, Rabinowitz and Nottingham 1986, Crawshaw and Quigley 1991).
- Another reason they hunt during the day in the JRC area is because the caimans, their favorite prey, are out at that time of day to take sun baths on the riverbank.



- Apex predator.
- Keystone predator.
- Obligate carnivore, feeding only on meat.
- Largely solitary, stalk-and-ambush predator.

Friday, December 17, 2010

- The jaguar is a largely solitary, stalk-and-ambush predator, and is opportunistic in prey selection
- It is also an apex and keystone predator playing an important role in stabilizing ecosystems and regulating the populations of prey species.



Jaguars use all their senses when hunting, but probably rely most on their sight and hearing.

Friday, December 17, 2010

While the sense of smell is well-developed in Jaguars, they seem to use their eyes and ears most when hunting.

A hunting
male Jaguar



The habitat he
was covering



Friday, December 17, 2010

When hunting, Jaguars walk fairly steadily, with head slightly bowed, obviously very intent.

Wilson hunting along the shore of the Rio Cuiabá – 07 June 2009



A hunting
male Jaguar

A Jaguar trail along
the right bank of the
Caxiri.



Friday, December 17, 2010

- In the Pantanal, Jaguars will often hunt by walking along the river banks, looking for caiman, capybara, waterbirds, or whatever else they come upon.
- We found fresh Jaguar tracks here on 03 July 2009.
- Wilson hunting along the shore of the Rio Cuiabá - 07 June 2009



They are very intent when stalking their prey, blocking out extraneous stimuli.

Friday, December 17, 2010

When hunting, Jaguars first stalk, then rush – in the manner of most felids. Here's Wilson stalking prey along the Rio Cuiabá. (07 June 2009)



The forepaws of Jaguars are wider than the hind paws because the wider forepaws aid it in capturing its prey .

Friday, December 17, 2010

As with all cat prints, with the exception of those of the Cheetah, the claws don't show.
Rio Manu by Cocha Juarez, 01 Aug 1991



Front paw of a Jaguar.

Friday, December 17, 2010

A Jaguar's forepaw has five toes, but only four leave prints because the "thumb" is higher, keeping the most developed claw free of the ground. The hind foot has four toes.

....from *The Jaguar*

by Rafael Hoogesteijn and Edgardo Mondolfi, 1992, Armitano Publishers (Armitano Editores C.A.)



A Jaguar's claws exposed.

Friday, December 17, 2010

- Here you can see the five claws on the front paws of a Jaguar grooming itself.

- Wilson - Rio Cuiabá - 04 July 2009



peccaries



fish



deer



large birds



armadillos



turtles



capybaras



caimans

Friday, December 17, 2010

- The Jaguar's diet includes more than 85 types of prey (Seymour, 1989): caimans, capybaras, fish, birds, cattle, and even other Jaguars.
- This slide shows some of their more common prey.
- Opportunistic in prey selection.
- Jaguars may prefer large prey, but will eat almost anything they can catch.
- In captivity Jaguars eat about 1.4 kg of meat a day.
- Studies indicate that jaguars and pumas in one area (Manu National Park) killed about 23-29% of the deer population per year.



Some individuals become very adept at catching fish.

Friday, December 17, 2010

Like all predators, individual Jaguars become especially good at capturing one kind of prey, then tend to specialize on it.

Wilson along the Rio Cuiabá with a Piranha, 26 June 2009.



Wilson with a Black-crowned Night-Heron

Friday, December 17, 2010

- At the same time, also like all predators, Jaguars are opportunistic, and will not pass up an opportunity that presents itself.
- This shot shows Wilson, our most frequently seen Jaguar, photographed about 10 minutes from JRC right after capturing a Black-crowned Night-Heron. He was hunting along the river bank when we came upon a group of herons and egrets roosting in a large riverside shrub. Wilson walked into one side of the bush and herons and egrets exploded out the other side. A few moments later Wilson emerged with this Black-crowned Night-Heron in his mouth.
- Wilson along the Rio Cuiabá, 07 June 2009.



Jaguars will take
prey that is quite
large...

adult Capybara -
about 49-50 kilos

adult Jacaré or
Paraguayan Caiman -
about 50-60 kilos



Friday, December 17, 2010

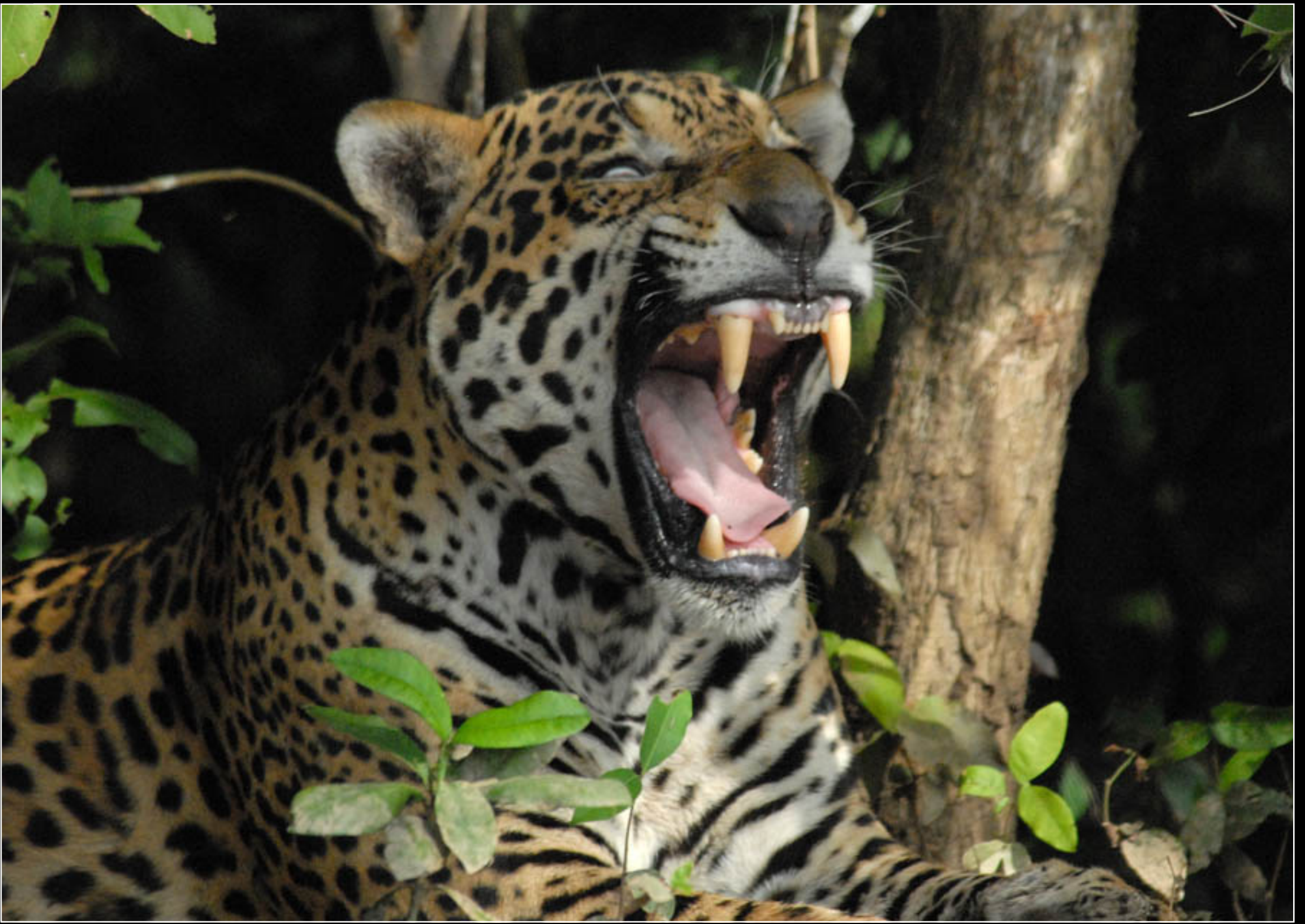
- In the Pantanal, Paraguayan Caiman and Capybara are probably their most common prey.



Cow killed by a Jaguar.

Friday, December 17, 2010

- They will also take animals as large as cows and horses.
- They have been known to kill bulls weighing up to 500 kg. (1102 pounds)
- The bent back head is typical of cattle killed by Jaguars.
- In many areas, cattle are ranches on what is essentially prime Jaguar habitat, and cattle have been the most frequent prey species documented in several analyses of Jaguar diet in Brazil.
- Some Jaguars turn to habitually killing cattle, and this behavior has definitely worked against the overall health of the species.
- Ranchers persecute Jaguars throughout their range, believing all Jaguars to be cattle killers, even though this is definitely not the case.

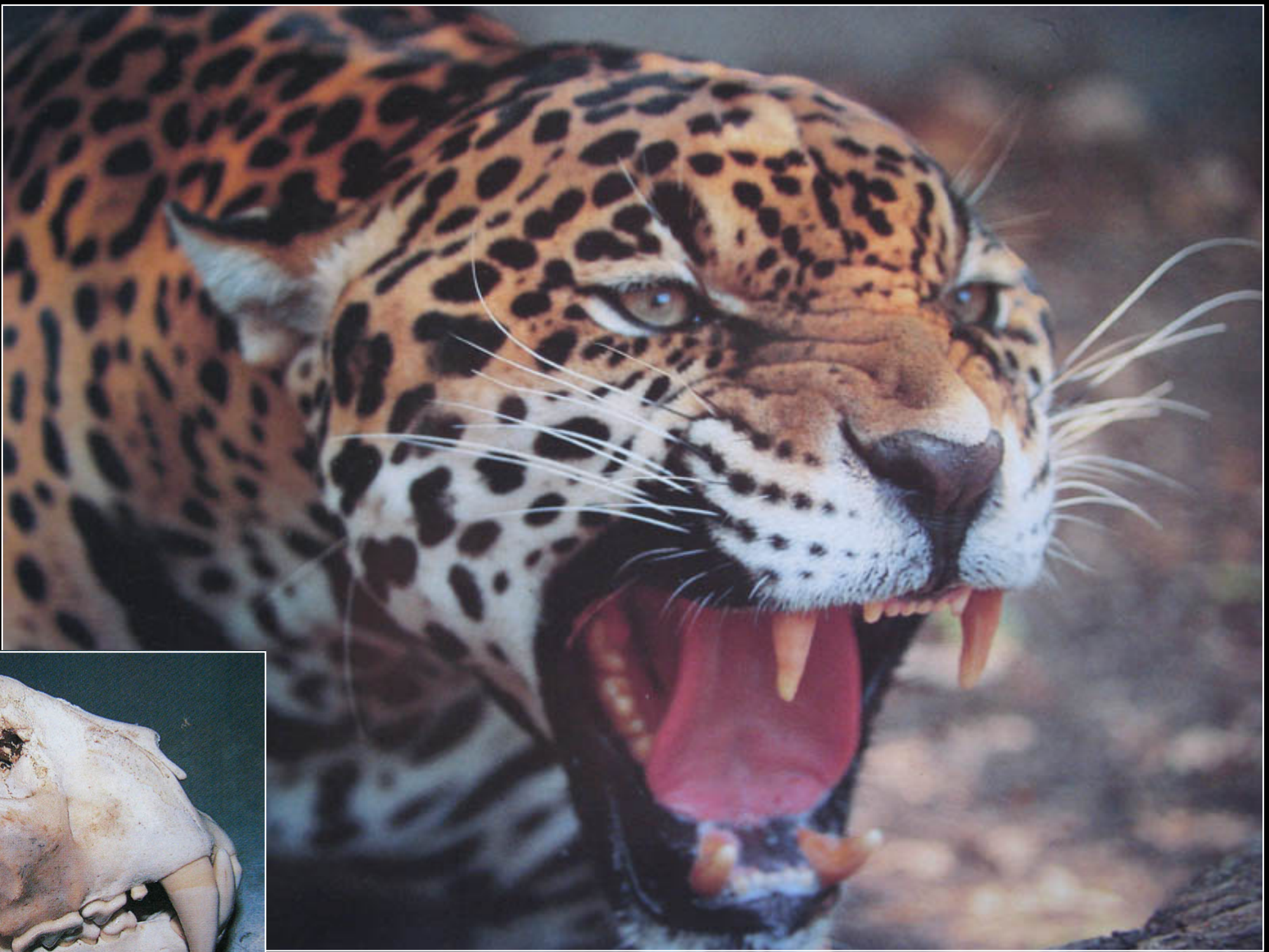


Large cats, including the Jaguar, typically kill with a neck or throat bite. Jaguars use this technique, penetrating the prey's skull.

Friday, December 17, 2010

- Note that they favor a bite to the lower back of the skull to kill their prey.
- Jaguars are the only big cats which regularly kill prey (especially capybaras) by piercing the skull with their canines.

Wilson - Rio Cuiabá - 09 July 2009



Jaguars have the most powerful bite of all the world's cats.

Friday, December 17, 2010

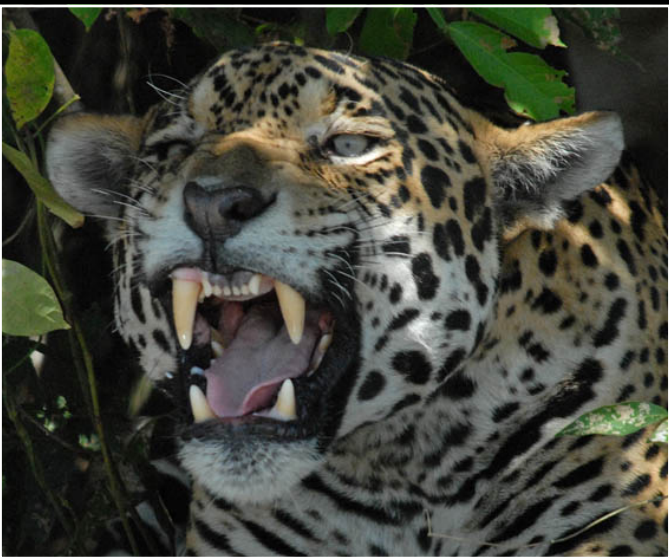
- It is surprising to some that the Jaguar has the most powerful bite of all cats---more powerful even than the much larger Tiger and the somewhat larger Lion.
- It is believed by some biologists that the large canines and powerful bite are adaptations for cracking open well-armored reptilian prey, such as land tortoises, river turtles and caiman.
- Emmons (1987) suggests that the massive head and stout canines of the jaguar are an adaptation to “cracking open” well-armored reptilian prey, such as land tortoises and river turtles. She notes that, following the late Pleistocene extinctions of large herbivores, the jaguar and the puma were the only representatives of five genera of North American felid to persist, and speculates that the jaguar evolved to take advantage of a formerly super-abundant prey base of water reptiles.



The large canines of a Jaguar are powerful weapons.

Friday, December 17, 2010

Wilson - Rio Cuiabá - 04 July 2009



An aluminum cooking pot chewed by a Jaguar.

Friday, December 17, 2010
Wilson came upon this pot containing some meat juices at the Jaguar Research Center.

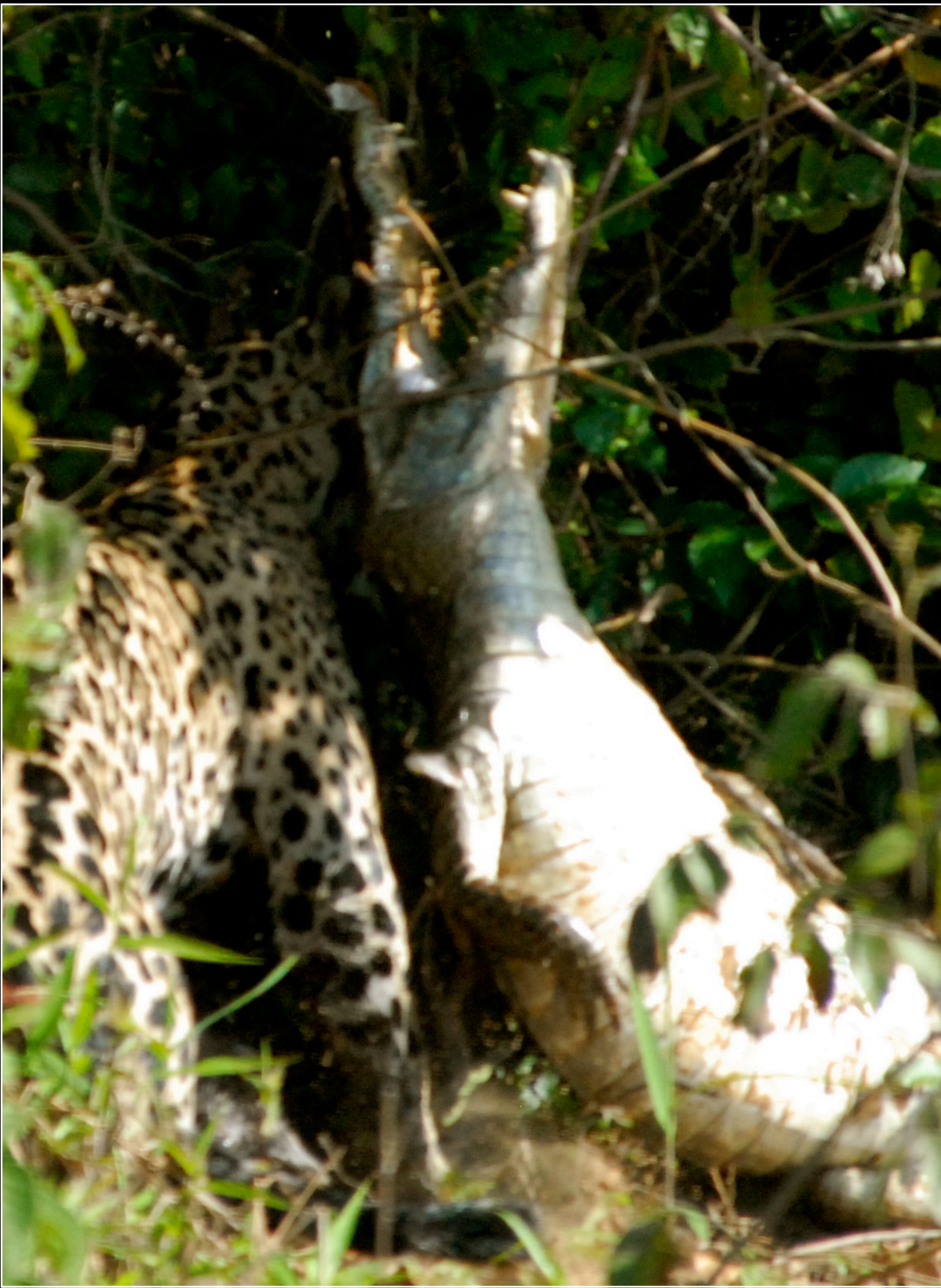


Like all cats, Jaguars have a raspy tongue.

Friday, December 17, 2010

This aids them in stripping flesh from bone.

Wilson - Rio Cuiabá - 04 July 2009



As with many other large cats, after making a kill, Jaguars will often drag their prey, even very heavy prey, a great distance before beginning to feed.

Friday, December 17, 2010

- Here is a female named Pollyana. She was photographed by us 10 minutes from here killing a LARGE Paraguayan Caiman. Here she is dragging the unfortunate caiman into the brush to kill and eat in privacy.
- Large kills are dragged into dense cover sometimes carrying and dragging the prey over considerable distances of up to a mile. Although the average drag distance is 87 metres in Brazil (for the capybara), there are stories of feats of strength and endurance, such as:
 - a female jaguar weighing 41 kg dragged prey weighing 180 kg over 200 metres of steep and rocky terrain.
 - a jaguar dragging a dead cow into the Apure River and swam 800 metres across the river with the cow in tow.

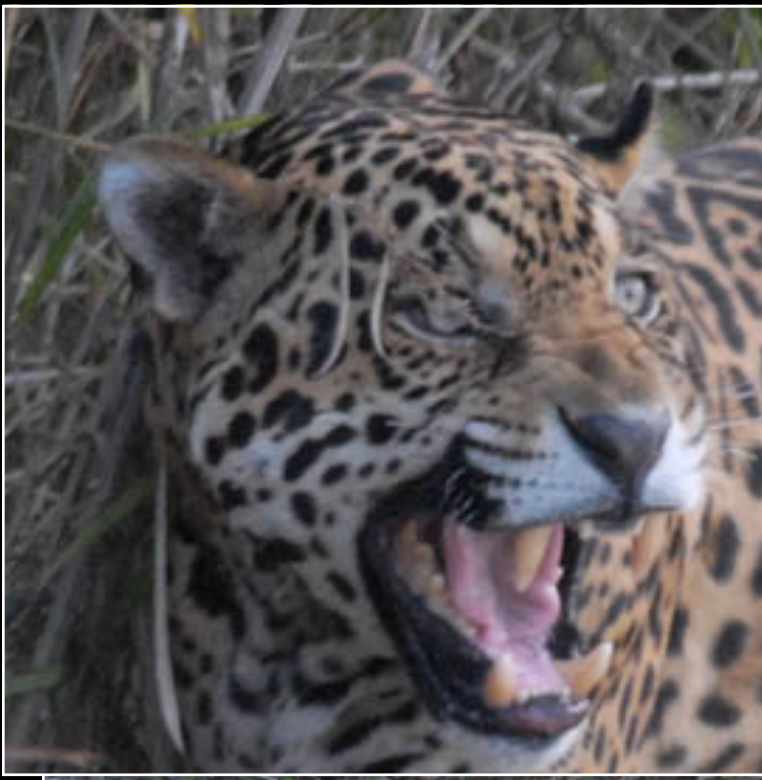
Also like other large cats, Jaguars will usually return to a kill.

They spend an average of 2.5 days near their killed prey and at a distance of no more than 200 meters.



Friday, December 17, 2010

- Tipped off by vultures, at around noon on 17 June 2009 we first found this Jacaré or Paraguayan Caiman killed by a Jaguar. It was obvious from the trail of flattened vegetation that the Jaguar had dragged his kill a good distance to that spot. When we returned to the site at about 4:30 PM, we discovered that the caiman carcass had been moved.



Site of the Jaguar charge.

Friday, December 17, 2010

- After searching the area, I eventually found the Jaguar with his kill about 60 meters from the spot where we initially discovered it. The Jaguar roared twice and charged out of the vegetation at the spot indicated by the arrow.
- Curiosity gets you killed by the cat!
- Regretfully, I did NOT get a photo of the charging cat.
- Jaguars, like other large cats, have two types of charge – the one when they are attacking prey, and bluff or mock charges, like the one I experienced, where they are trying to scare potential competition away from their kills or young.



Site of a Jaguar attack on the Rio Paraguai.

Friday, December 17, 2010

- Jaguars do occasionally attack and kill humans, however, most Jaguar attacks occur for one of three reasons...
 1. the victim is a hunter who has cornered or wounded a Jaguar...
 2. the victim has stumbled upon a mother with young...or
 3. the victim has stumbled upon a Jaguar with prey.
- Given the frequency with which people come into contact with Jaguars, unprovoked attacks on humans are rare, but do occur.
- This attack in the northwest Pantanal seems to be one of those exceptions. A father and son were fishing along the Rio Paraguay. The father went off, leaving his 19 year old son sleeping in his tent. When the father returned to the campsite he discovered two Jaguars who had ripped into the tent and were eating his son.
- The next slide showing the victim of this attack is VERY graphic and VERY disturbing, so I'll warn you that you may want to close your eyes. It reminds me that I need to maintain my respect for these large cats.



Victim of an attack by two Jaguars.

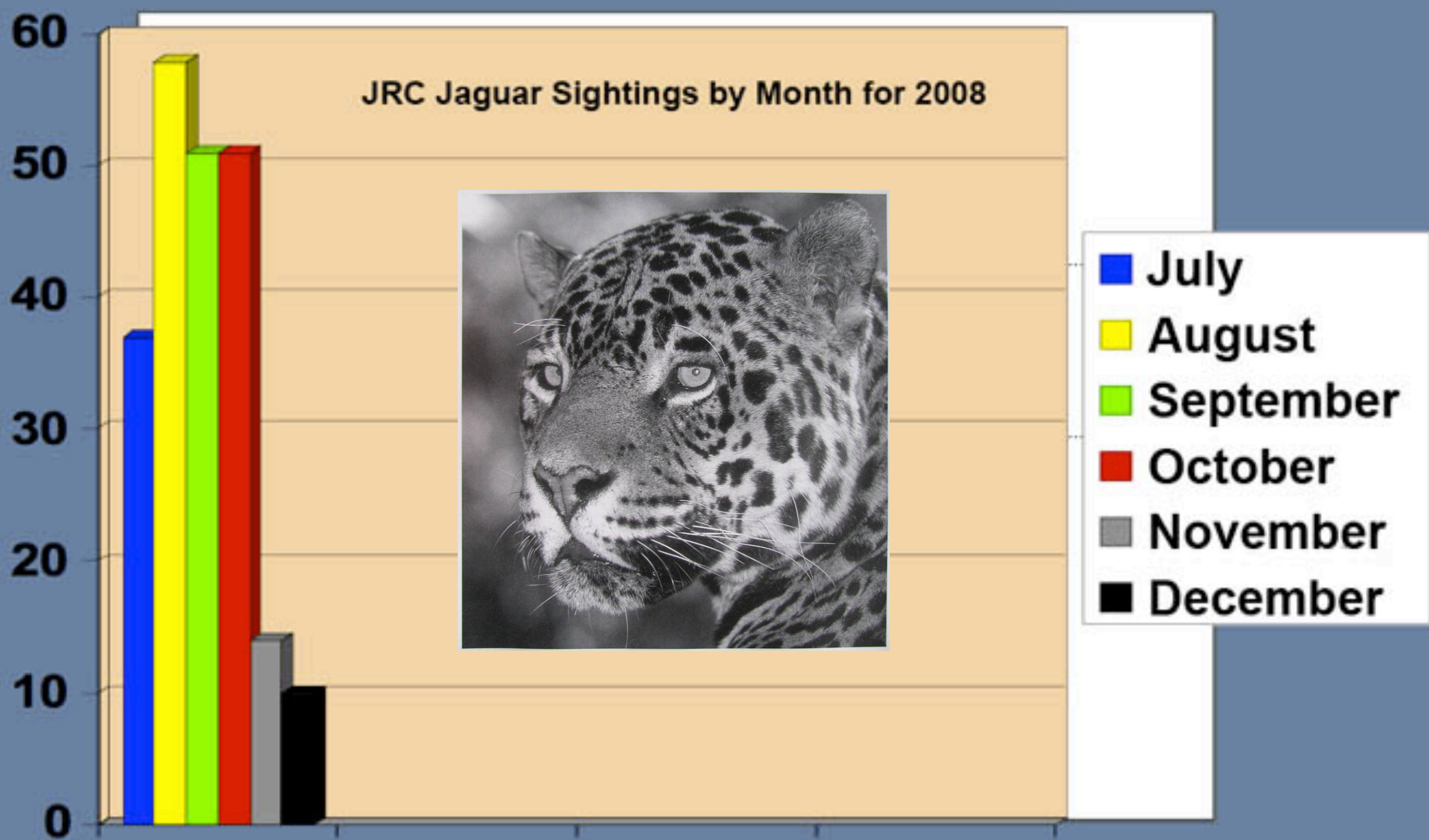
Friday, December 17, 2010

- Aside from finding them beautiful and magnificent creatures, I also have a morbid curiosity about them.
- I'm intrigued by creatures that can eat me.



Friday, December 17, 2010

Tell story of Jaguar that came into fisherman’s boat for the fish he was catching.



The mid and later dry season are when the most Jaguar sightings occur.

Friday, December 17, 2010

This is probably correlated with the greatest abundance of prey – caimans, capybara, waterbirds, etc. – along the rivers.

Capybara and caiman
congregate on the sandbars
that form along the rivers in
the dry season.



Friday, December 17, 2010

- This abundance of prey along the rivers makes for relatively easy hunting for the Jaguars during that season.
- In the wet season, there are a few, VERY few points of high ground that never flood, and those are covered by caiman skulls as they are the killing fields where Jaguars take caimans to process during the high water period.
- In their Pantanal study, resident jaguar annual home ranges averaged 142 km² (n= four females, one male). The male's home range was not larger than the females'. Female home ranges overlapped an average of 11.5% during the dry season, but not the wet. Mean wet season home range (13 km²) was significantly smaller than during the dry season due to extensive flooding; jaguars used only 4-13% of their total annual ranges during the wet (Crawshaw and Quigley 1991).

Caminho das águas

As cheias e vazantes dependem do ritmo das chuvas nos planaltos do entorno, provocando a inundação a partir das bordas da planície em direção ao rio Paraguai, o grande escoadouro de todas as águas. O gráfico mostra, de forma geral, como a água desloca-se para a parte central e, depois, desce o curso do rio Paraguai, durante cada ciclo anual.



Progression of high water levels

Friday, December 17, 2010

- The water level in the Pantanal is dependent on rainfall in the higher surrounding areas.
- The seasonal flooding of the area begins in the N and E and the flood gradually moves S and W across the region.
- From this diagram you can see how August through October are generally the period with the lowest water levels, and with prey most concentrated along the major watercourses.



- The Jaguar is the largest of seven species of cats found in the Pantanal.
- Adults weigh 72-155 kilos

Friday, December 17, 2010

- The Jaguar, at 72-155 kilos (159-342 pounds), is the largest of seven species of cats found in the Pantanal.
- The other six species, in decreasing order of size, are.....

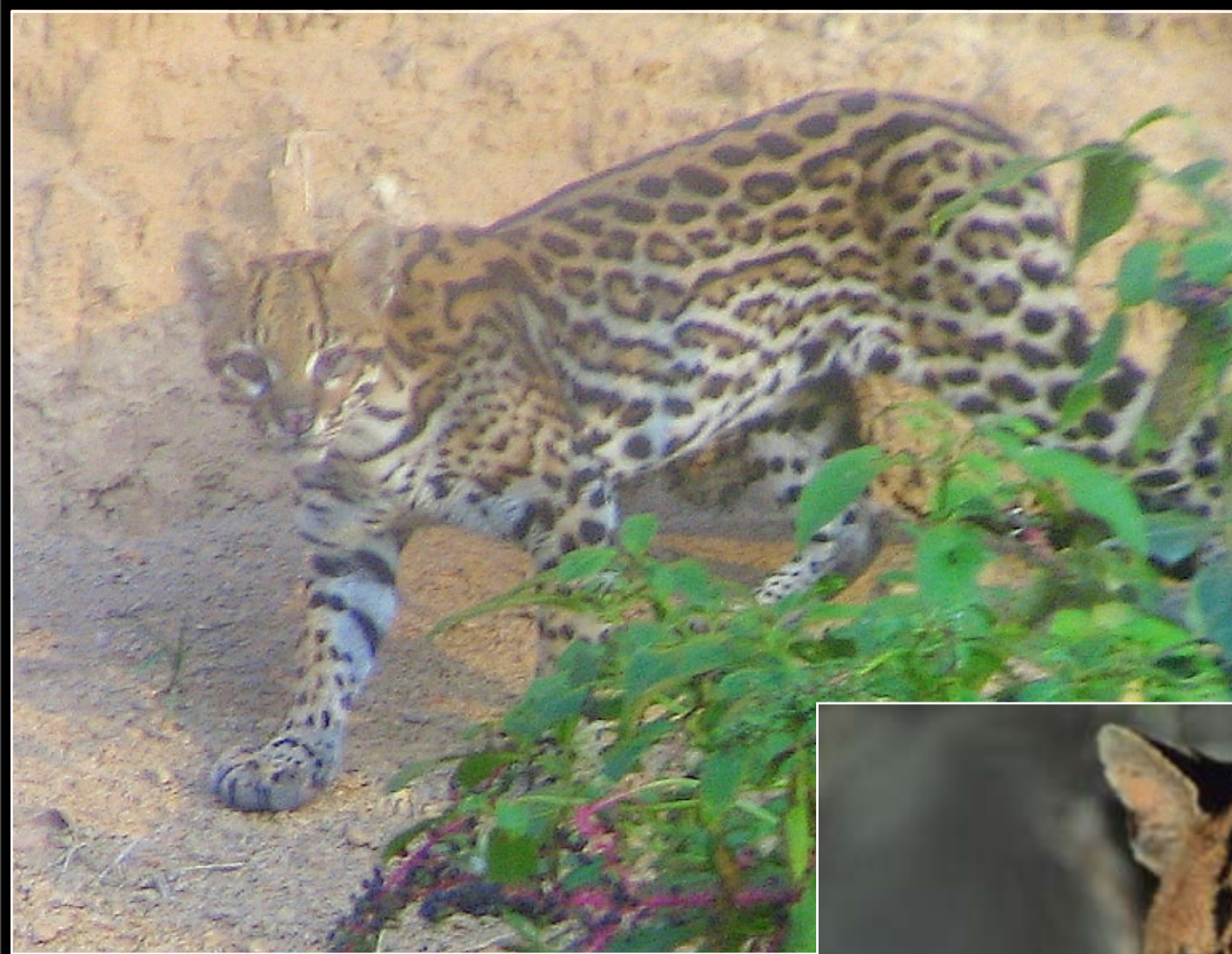
Puma
Felis concolor
25-80 kilos



Friday, December 17, 2010

- The Puma, also known as Mountain Lion and Cougar, is the most widely distributed cat in the hemisphere.
- It is generally associated with drier environments, avoiding wetter areas where the Jaguar hunts most frequently. (from *The Jaguar* by Rafael Hoogesteijn and Edgardo Mondolfi, 1992, Armitano Editores C.A.)

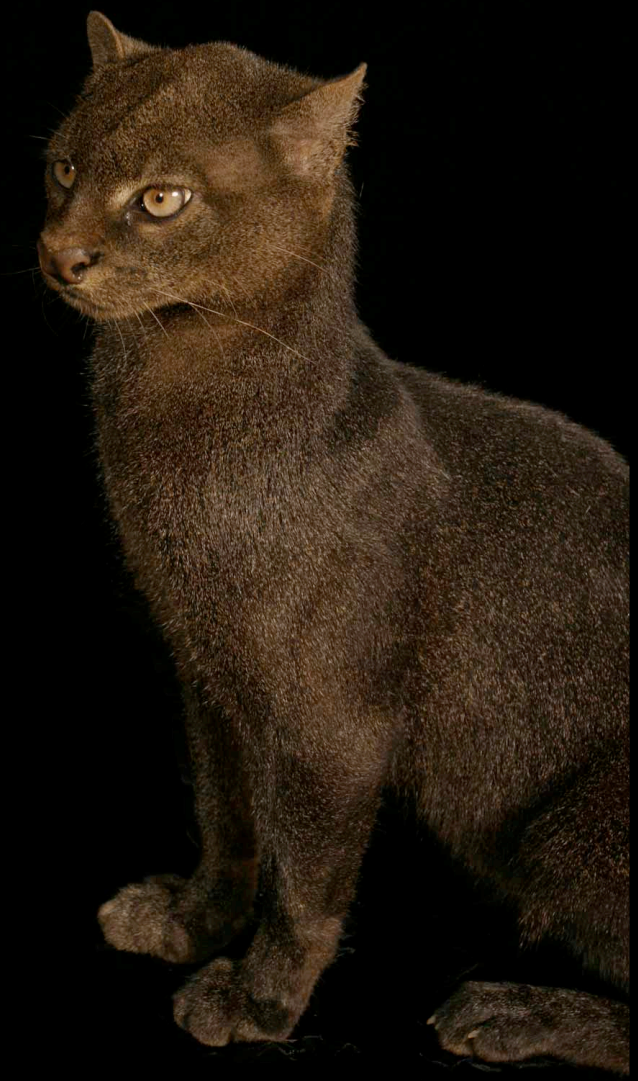
Ocelot
Leopardus pardalis
6.6-16.0 kilos



Friday, December 17, 2010



Jaguarundi
Herpailurus yagouaroundi
3.5-7.0 kilos



© FS-2005



Margay *Leopardus wiedii*
3-4 kilos

Friday, December 17, 2010



Pantanal Cat
*Leopardus
braccatus*
1.7-3.7 kilos



Friday, December 17, 2010

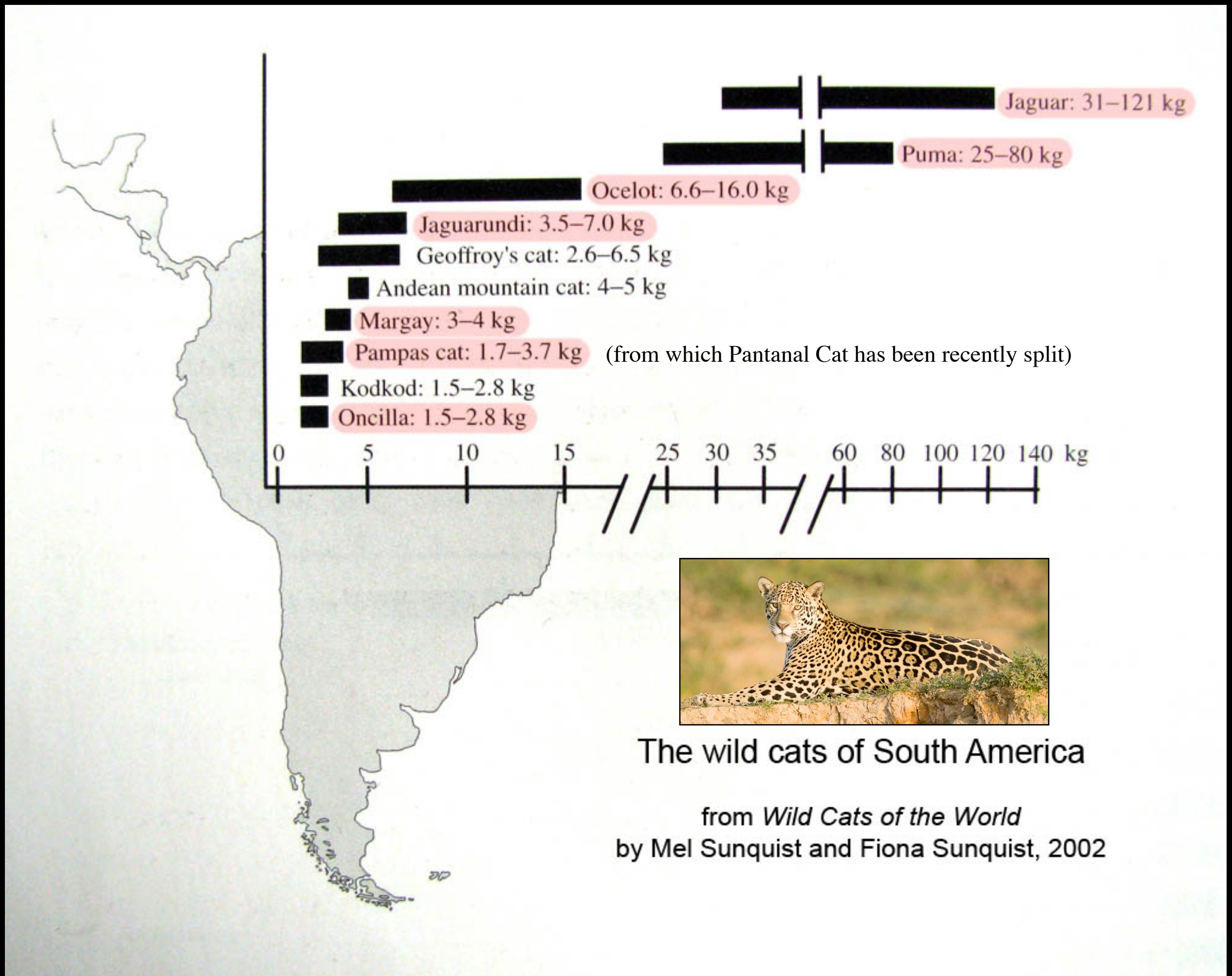
- This species has been split relatively recently from the Colocolo or Pampas Cat, *Leopardus colocolo*.
- However, in the new *Handbook of the Mammals of the World, vol. 1, Carnivora* (Wilson & Mittermeier, 2009, Lynx Editions) Pantanal Cat has been lumped back in Colocolo/Pampas Cat.



Oncilla or Little Spotted Cat *Leopardus tigrinus*
1.5-2.8 kilos

Friday, December 17, 2010

The Oncilla is tied with the Kodkod of the Andes as the smallest cat in the Americas and is one of the smallest wild cats in the world.

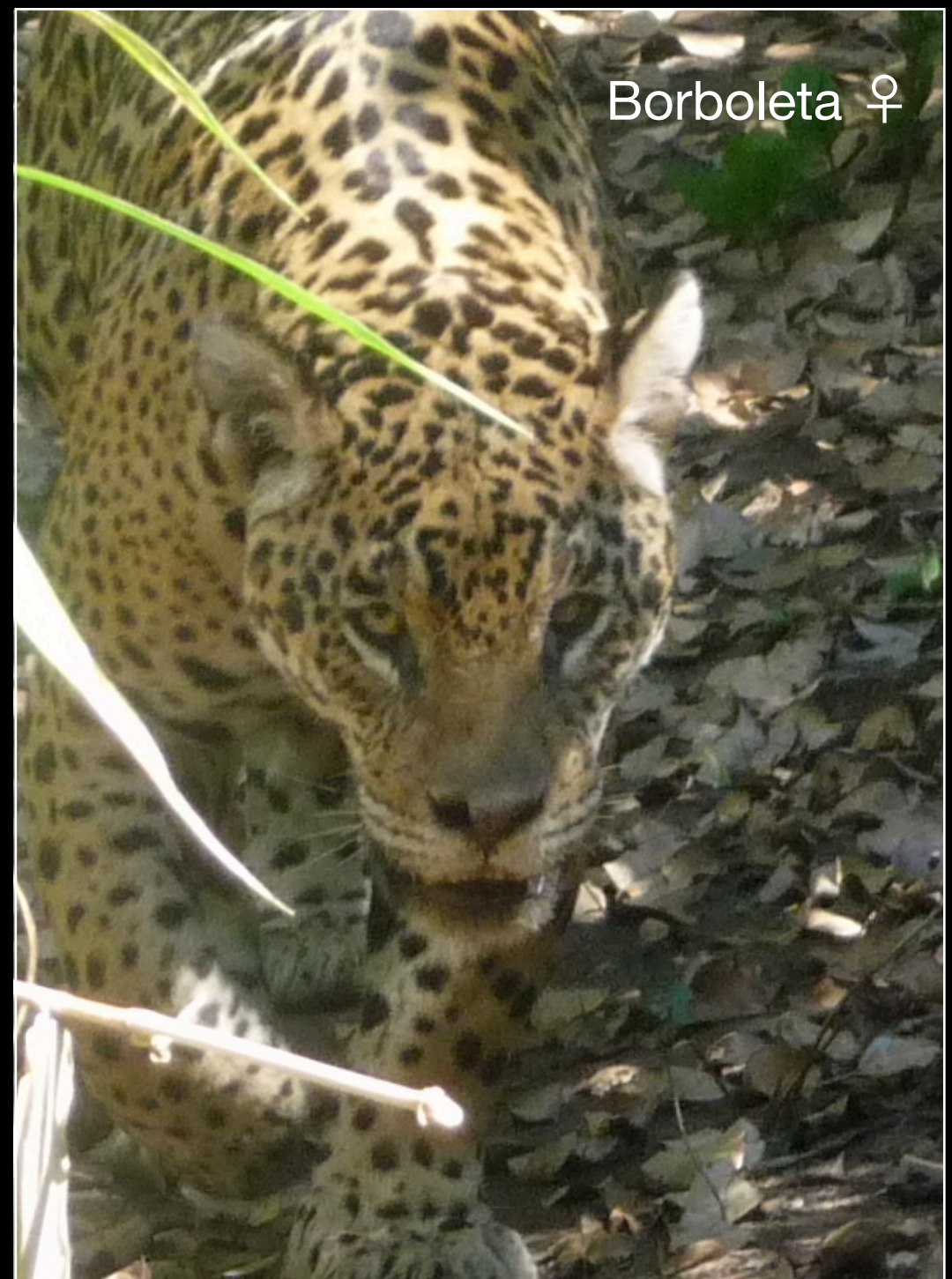
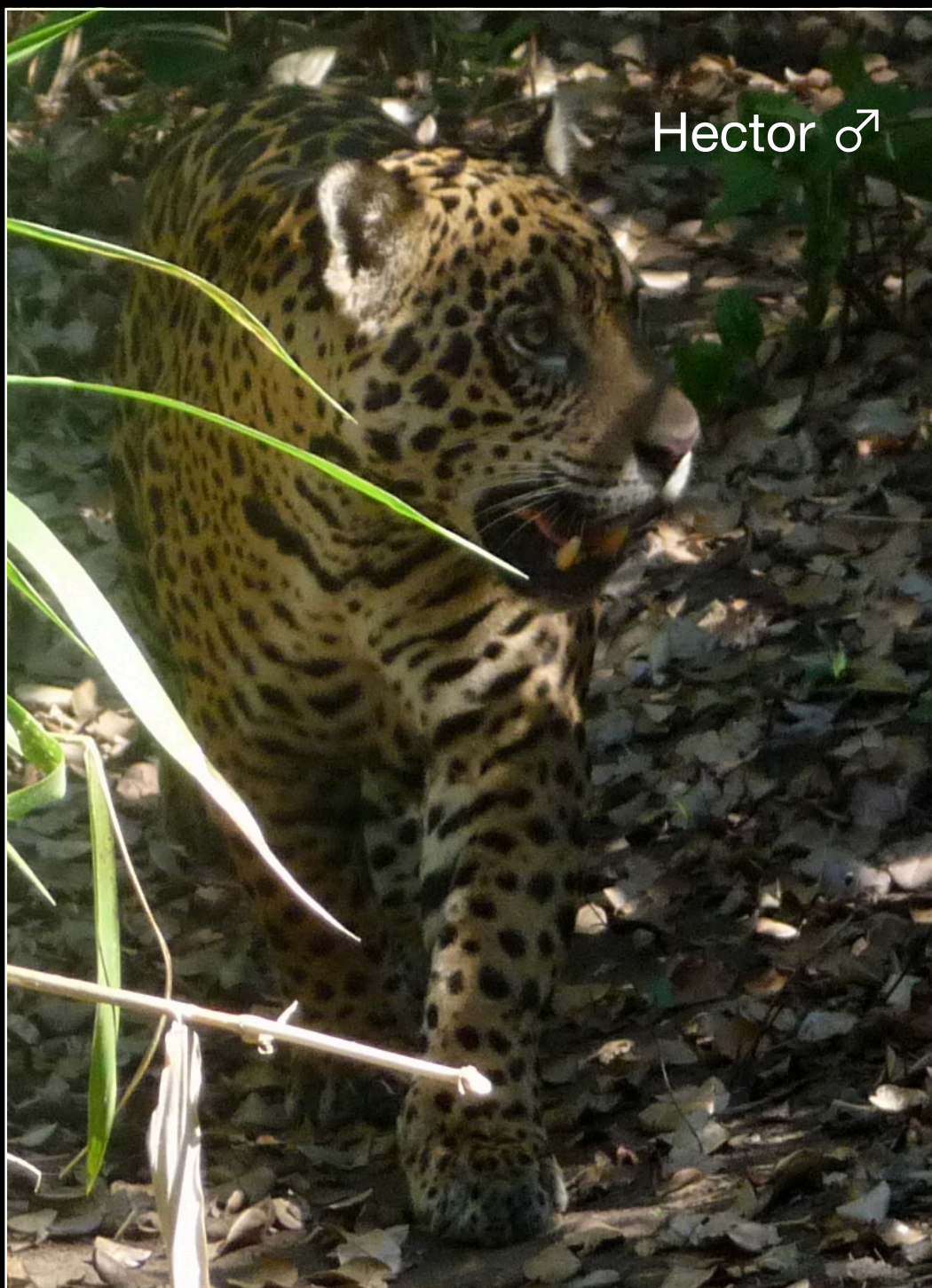


Friday, December 17, 2010

While these seven species of cats, like most predators, are opportunistic hunters, in general, the larger the cat, the larger prey they will take.

This partitioning of resources lessens the direct competition between the seven species and allows them to coexist.

Pollyana



- Females are in estrous for 6-17 days, during which time they wander and call for males.
- Up to 4 males may join a female.
- Male home ranges include the home ranges of several females.
- Both sexes will range more widely than usual during courtship.

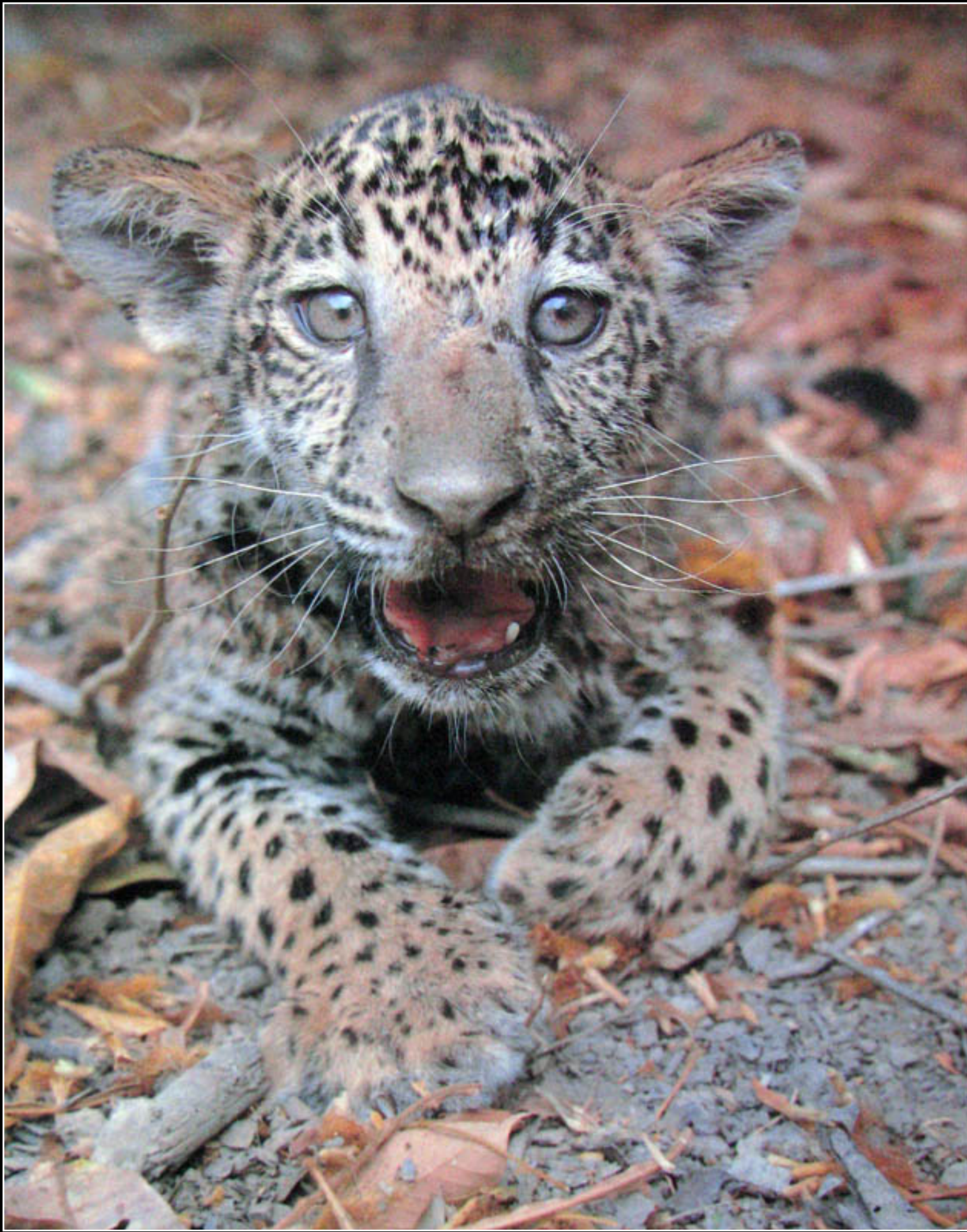
Friday, December 17, 2010

- Borboleta (Butterfly) ♀ and her suitor Hector ♂ at the JRC camp on August 10th 2008. They spent a few days in August 2008 chasing each other around the trails of the JRC camp while in full courtship.
- The JRC team saw this pair twice in the camp during the daytime of 8 Aug 2008 at distances of only 15 meters (50 feet). They mostly appeared between tents 1 through 4.
- The cubs were seen alone in the Corixo São Pedrinho.
- Female estrous is 6–17 days out of a full 37-day cycle, and females will advertise fertility with urinary scent marks and increased vocalization.
- Both sexes will range more widely than usual during courtship.
- In their Pantanal study, resident jaguar annual home ranges averaged 142 km² (n= four females, one male). The male's home range was not larger than the females'. Female home ranges overlapped an average of 11.5% during the dry season, but not the wet. Mean wet season home range (13 km²) was significantly smaller than during the dry season due to extensive flooding; jaguars used only 4-13% of their total annual ranges during the wet (Crawshaw and Quigley 1991).



Paris seems to be a pregnant female.
1-4 cubs are born after a gestation period of about 100 days.

Friday, December 17, 2010



- Females have one to four cubs per litter.
- At birth cubs weigh about 5.5 kilos (12 pounds).
- They begin to accompany their mother when about 2 months old.
- They may continue to nurse until they are about 5-6 months old.

Friday, December 17, 2010

- While adult Jaguars are probably reproductively active year-round, seasonal birth peaks may be correlated with prey availability.

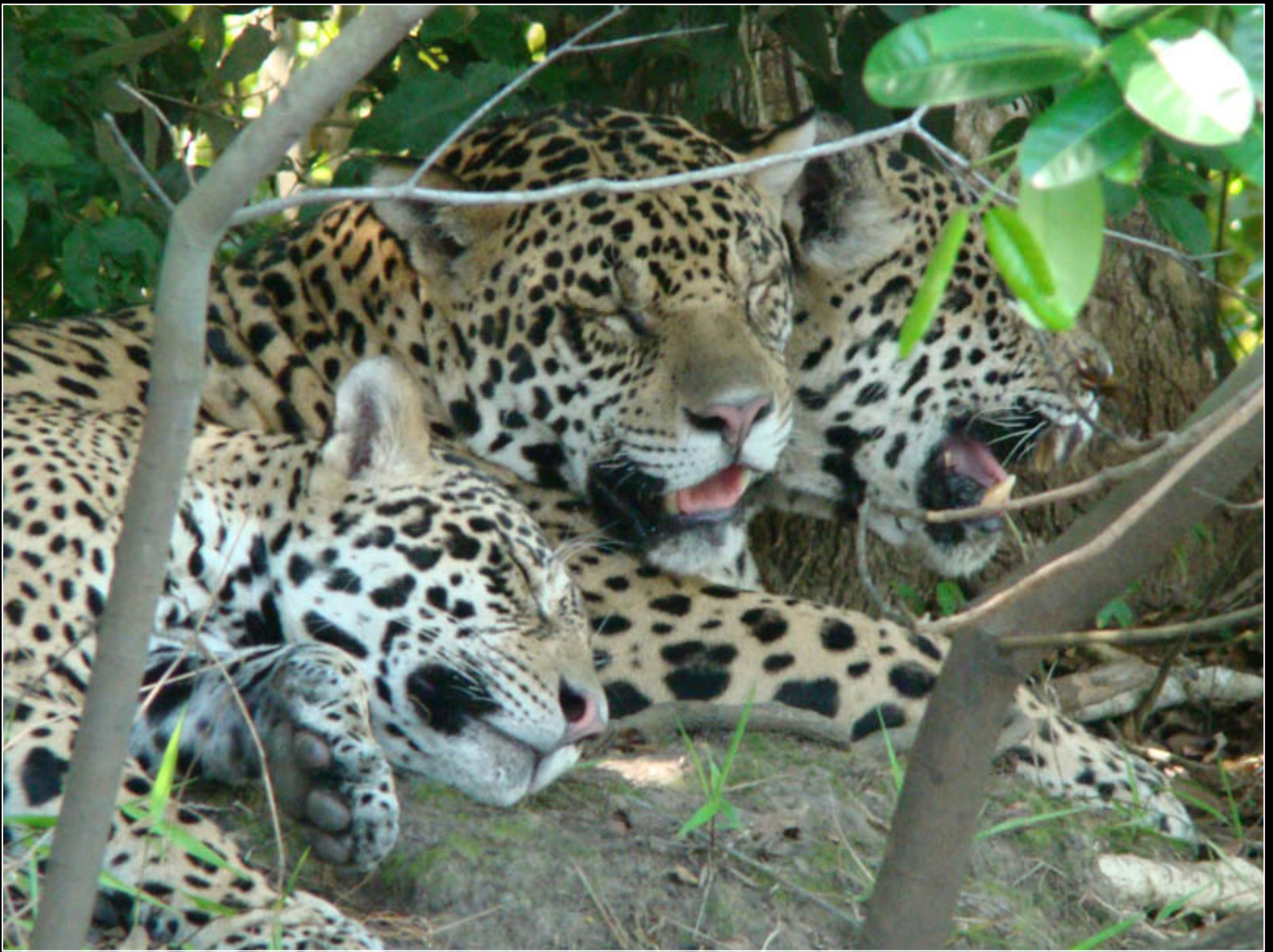


- At about 15-18 months of age the offspring are traveling independently and making their own kills.
- At about 2 years of age the offspring are independent.

Borboleta and her two, full-grown cubs, Geoff and Estela.

Friday, December 17, 2010

Here is Madame Butterfly or "Borboleta", and here are her two, full-grown cubs: Geoff and Estela.



For the last six months before cubs leave their mother, they are as big as she is.

Friday, December 17, 2010

Borboleta with Estela and Geoff.



A black Jaguar or “black panther”

Friday, December 17, 2010

- Black Jaguars are an example of melanism.
- Melanism is more common among Jaguars than other felines and occurs most frequently in very hot, humid forest areas. (from ***The Jaguar*** by Rafael Hoogesteijn and Edgardo Mondolfi, 1992, Armitano Editores C.A.).
- This fits with Gloger’s Rule, that dark coloration in mammals occurs more frequently in warm, humid areas.
- Black Jaguars are very rare in the Pantanal, and none have been seen any in the study area.
- The melanism is monogenic - (an inheritable character that is controlled by a single pair of genes) - dominant to the normal golden-colored form, rather than through a recessive allele.



tawny
Jaguars are
already scary
enough!

Friday, December 17, 2010



The black rosettes are still present.

Friday, December 17, 2010

The black rosettes are still present on black Jaguars, just obscured by the overall dark pigmentation.



Black adult female with tawny young.

Friday, December 17, 2010

Black Jaguars can give birth to tawny young and vice versa.

JAGUAR CONSERVATION



Friday, December 17, 2010

Jack

Conservation status

- Approximately 100,000 Jaguars in the wild today.
- Jaguar was listed on Appendix I, the highest level of protection, of the Convention on International Trade in Endangered Species (CITES) in 1973.
- Since 1967 it has been illegal to kill a Jaguar in Brazil, however, the law is not often enforced.
- Jaguars are protected through conservation areas and by living in remote, often inhospitable areas.



Friday, December 17, 2010

Explain what CITES is and how it has been reasonably effective in controlling the international trade in endangered species

name some of the conservation areas in this part of Brazil

explain how the flooded nature of much of the Pantanal inhibits human intrusion

The IUCN Red List of Threatened Species lists Jaguar as Near Threatened, which means: “may be considered threatened with extinction in the near future, although it does not currently qualify for the threatened status.

MAP OF THE PANTANAL



Conservation status in the Pantanal

- Approximately 4000-7000 Jaguars in the Pantanal, an area of about 140,000-210,000 square kilometers....
- The densest concentration of the species within its range.
- Approximately 200-300 Jaguars are killed in the Pantanal each year.

Friday, December 17, 2010

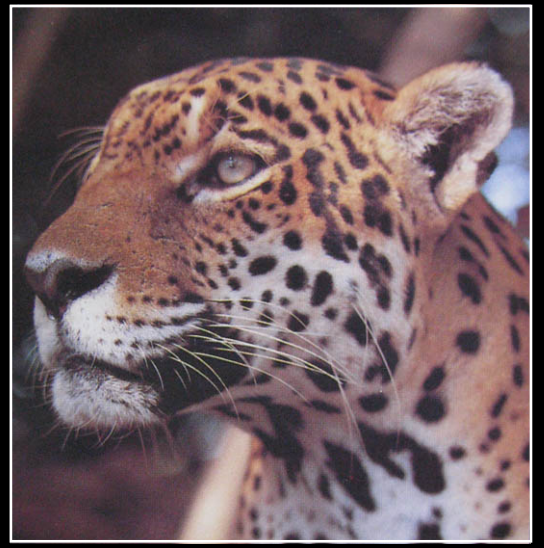
- The maximum Jaguar density for the Pantanal in ideal habitat is about 6 per 100 square kilometers (from whose research is this density?). Figuring the Pantanal at 150,000 to 200,000 square kilometers, that would mean 9000-12,000 Jaguars.
- However, as much of the Pantanal does not qualify as ideal habitat, the actual number of Jaguars is going to be considerably lower than 9000-12,000, hence the 4000-7000 estimate.
- This is still the densest concentration of Jaguars of anywhere within their range.
- The extent of the Pantanal is estimated, depending on the source, at between about 140,000 square kilometers (54,000 square miles) and 210,000 square kilometers (81,000 square miles).
- Jack



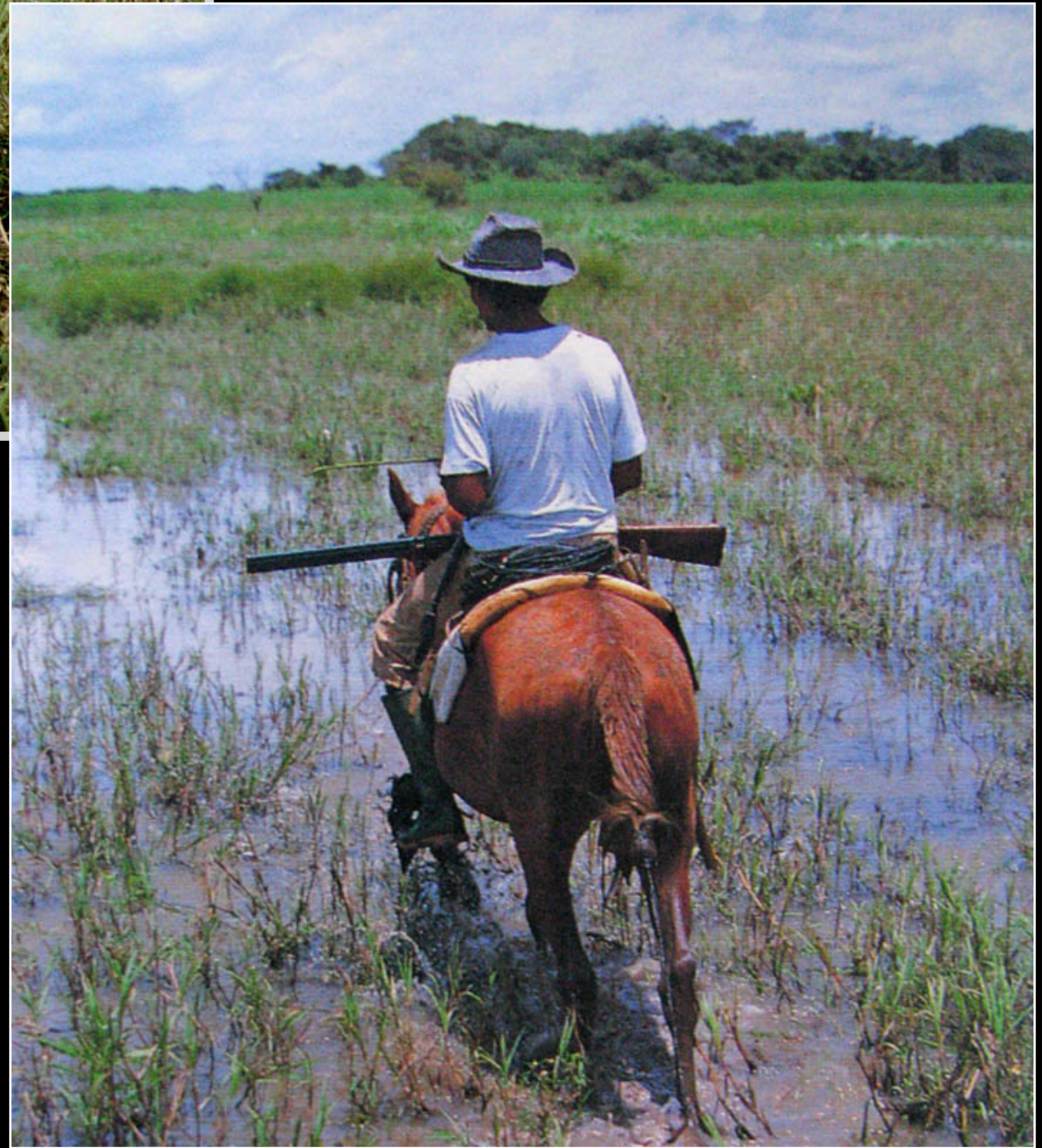
Illegal commercial fishing boat in Meeting of the Waters State Park.

Friday, December 17, 2010

- Illegal commercial and sport fishing, are threats to the fish stocks in Parque Estadual Encontra das Aguas.
- Fishing is prohibited in the park, but unfortunately, enforcement of the law is very weak.
- Fish are an important part of the food web in the park, preyed upon by waterbirds and caiman, which are in turn preyed upon by Jaguars.
- Illegal commercial fishing boat along the Rio Tres Irmãos, 09 July 2009.



Cattle ranchers kill about 200-300 Jaguars each year in the Pantanal.



Friday, December 17, 2010

- The approximately 200-300 Jaguars killed in the Pantanal each year are killed primarily because they are believed to be potential cattle killers.
- Some Jaguars kill calves, but most do not. We know that some Jaguars ignore calves while specializing on caimans.
- In many areas, cattle are ranched on what is essentially prime Jaguar habitat, and cattle have been the most frequent prey species documented in several analyses of Jaguar diet in Brazil.
- Some Jaguars turn to habitually killing cattle, and this behavior has definitely worked against the overall health of the species.
- Ranchers persecute Jaguars throughout their range, believing all Jaguars to be cattle killers, even though this is definitely not the case.



In the past, sport hunters killed terrific numbers of Jaguars in South America, especially in the Pantanal and in the Llanos of Venezuela.

One would hope that this would be a thing of the past, but apparently some foreigners still illegally hunt the cats on large ranches in the south Pantanal.



Friday, December 17, 2010

- One would hope that this would be a thing of the past, but apparently there is still some illegal sport hunting by foreigners on private ranches in the south Pantanal.
- These foreign hunters pay around \$10,000 US for the chance to hunt a Jaguar.



The greatest threat today to Jaguars, across their range, is habitat loss....

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Despite the direct killing of Jaguars by cattle ranchers, pelt hunters and sport hunters, the far greater threat to the long term survival of the species is the the indirect killing through habitat destruction.



Cattle in
northern
Mato
Grosso,
Brazil.

....from deforestation caused by logging and mining activities,
and especially cattle ranching and large-scale agriculture.

Friday, December 17, 2010

- This is an area that would have been covered with tropical rainforest less than twenty years ago.
- Habitat loss is, in fact, the leading cause of extinction in general.
- cattle near Alta Floresta-2.jpg



- The cattle sector just in the Brazilian Amazon is responsible for 14% of the world's annual deforestation.
- It is the single largest driver of deforestation in the world.

Friday, December 17, 2010
cattle - Brazil-Paraguay
border.jpg

- More than 40% of forests and savanna of Pantanal already altered for cattle ranching
- More pasture still being created
- Forests cut and burned
- Exotic grasses introduced
- Herbicides applied to kill invading natural plants
- Pastureland burned annually



Degraded cattle pasture in the Pantanal.

Friday, December 17, 2010

- “More than 40% of the forests and savanna habitats of the Pantanal have already been altered for cattle ranching....”
- Above from: “Safeguarding the Pantanal Wetlands: Threats and Conservation Initiatives”, Harris *et. al.* 2005, *Conservation Biology*, 19 (3): 1-8]
- The forests are cut and burned, exotic grasses are introduced, herbicides are applied to kill invading natural plants, and the pastureland is burned annually to renew the pasture and control weeds and cattle pests, like ticks.

- Fazenda Santa Tereza - 11 July 2009



Brazil has the world's largest commercial cattle herd.....

Friday, December 17, 2010
cattle in Pantanal.jpg
July 1987



.....and is also the world's largest beef exporter.

Friday, December 17, 2010
brahma-01July2001-#12.jpg - Cattle in Bahia,
Brazil



Do you
recognize
this crop?



Friday, December 17, 2010

- You should know this plant as almost certainly you eat it, either directly or indirectly, on a regular basis.
- These are soybeans - and from an economic point of view, this is now one of the most important crops in the world.



Growing soybeans to feed cattle is a very poor use of cropland.

Friday, December 17, 2010

- Much of the deforestation not related to the DIRECT production of livestock is for the production of soybeans.
- In addition to being the world's largest exporter of beef, Brazil is also the world's largest exporter of soybeans, the bulk of which are used to feed livestock.
- Eating soybeans directly is a very efficient use of the land - feeding soybeans to cattle is NOT!
- It's about 10 times more efficient to eat the soybeans directly.

Pantanal



▲ SOYBEAN FRONTIER

The Brazilian soybean frontier is pushing into the Amazon Basin. This map shows the approximate limits of soybean expansion since the 1960s. At present soybeans are planted in less than 5 percent of the area within the limits shown here. Plans for major soybean farms in Brazil will continue the expansion of this frontier.

Friday, December 17, 2010

Atlas of the Amazon-20.jpg

- Soybean production began in the south, and has spread north into Brazil.
- Large areas of Brazil, first in the *cerrado*, the dry forest and shrubby savanna to the north and east of the Pantanal, and now in the Amazon, have been plowed under for soybean production.
- Fortunately, the Pantanal itself is too wet for soybean production.....



Newly prepared soy field in Bahia, Brazil.

Friday, December 17, 2010

soja field-06July2001-#13.jpg

-but that hasn't saved it. The run-off of agrochemicals from these agricultural areas is now one of the larger threats facing the Pantanal.
- "Pesticides are a major threat because of the enormous areas of agricultural land surrounding the Pantanal and along the headwaters of the main rivers that feed the floodplain."
- Mato Grosso, the Brazilian state in which much of the Pantanal is located, is the state with the highest deforestation rate and highest and soybean production rate.
- Also..."Conversion of natural habitats in the neighboring *cerrado* has led to severe erosion, causing sediment deposition in the lowlands of the Pantanal and altering the patterns of water flow and hydrological regimes."

Above from: "Safeguarding the Pantanal Wetlands: Threats and Conservation Initiatives", Harris *et. al.* 2005, *Conservation Biology*, 19 (3): 1-8]



Hidrovia

Pantanal



Friday, December 17, 2010

- The *hidrovia* is a controversial plan by the five countries of the La Plata Basin to convert the 3,400 km/2,100 m Paraguay and Paraná river systems into an industrial shipping channel.
- The Paraguay River is one of the two main rivers of the Pantanal.
- Scientists predict that the channelization of the Paraguay River would cause the Pantanal wetlands to shrink...rainfall would run off and water pass through the system much more rapidly, as has happened in the Everglades.
- There would be associated losses in biodiversity.
- Of course, the two main things that would be shipped are cattle and soy.
- The original plan was developed in 1995. Due to lots of opposition from scientists and environmentalists, the project is more or less in limbo at the moment, but, like all bad ideas, refuses to die.



Then there is global warming.....

Friday, December 17, 2010

- Then there is global warming...
- First, the cattle contribute directly to global warming through the production and release of methane, which is 25 times more potent than CO₂ as a greenhouse gas...
- Second, the cattle sector just in the Brazilian Amazon is the single largest driver of deforestation in the world, so there is less forest available to absorb atmospheric CO₂....
- Lastly, there is the positive feedback loop that is established....the warmer it gets, the drier it gets...the drier it gets, the more the forest burns...the more the forest burns, the more CO₂ it releases.... the more CO₂ is released, the warmer it gets...and so on
- Scientists using NASA satellite data have found that clearing for mechanized cropland has recently become a significant force in Brazilian Amazon deforestation. This change in land use may alter the region's climate and the land's ability to absorb carbon dioxide.
-

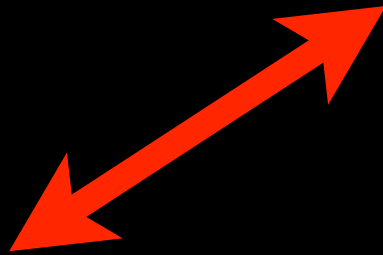


The “Hamburger Connection”

Friday, December 17, 2010

- Fast food restaurants along Route 1 in Maine.....a familiar scene throughout the United States.
- Our eating habits have a direct impact on Jaguar habitats throughout Brazil and the rest of tropical America.

fast food restaurants.jpg



Everything Is
Connected!

Friday, December 17, 2010
I think this is one of the most important lessons we have to
learn



What we choose to eat matters.

Friday, December 17, 2010

- The single most important thing we can do to benefit the environment is not recycling....and it's not driving less...and it's not taking shorter showers, it's changing our diet...

1. eating local
2. eating organic
3. and, most importantly, eating lower on the food chain - especially, eliminating beef from our diet

- Brahma-Costa Rica-2.4.jpg



Jaguars.....



.....or cows?

Friday, December 17, 2010

In the end, we can have a world where Jaguars still roam wild, or we can have a world populated by cows - I'm not sure we can have both.

Wilson - Rio Cuiabá - 11 July 2009



If habitat destruction isn't stopped, this may be the only view that future generations ever have of a Jaguar.

Friday, December 17, 2010

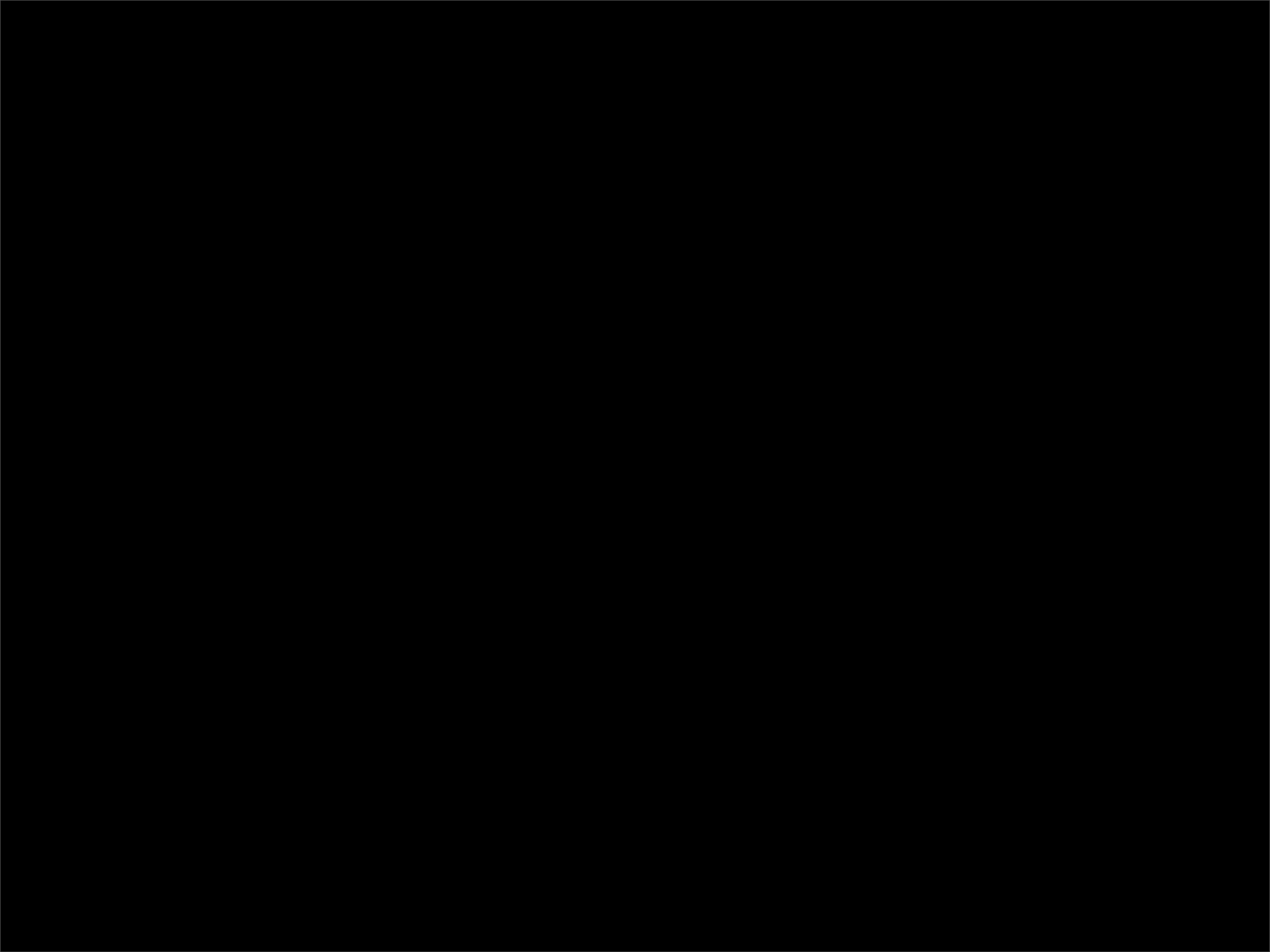
If habitat destruction isn't stopped, this may be the only view that future generations ever have of a Jaguar.

Credits

Contributors of photographs include Paul Donahue, Teresa Wood, Edilene Gonçalves Nobre, Peter Oxford, David Plummer, Alyson Melo, and Nigel Mirren.

Many of the photos in this presentation have been borrowed from the book ***The Jaguar*** by Rafael Hoogesteijn and Edgardo Mondolfi, 1992, Armitano Editores C.A.

Other photos have been borrowed from the book ***Wild Cats of the World*** by Mel Sunquist and Fiona Sunquist, 2002, University of Chicago Press

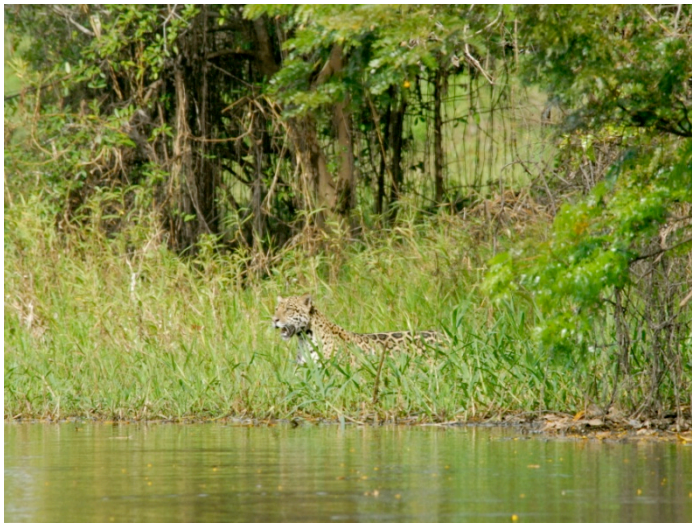


Friday, December 17, 2010





Jaguar Research Center



Friday, December 17, 2010

Borboleta, Estela waited for Geoff to cross the stream. He crossed after about 45 minutes. Borboleta met him half way and dunked him twice to punish him for not coming.



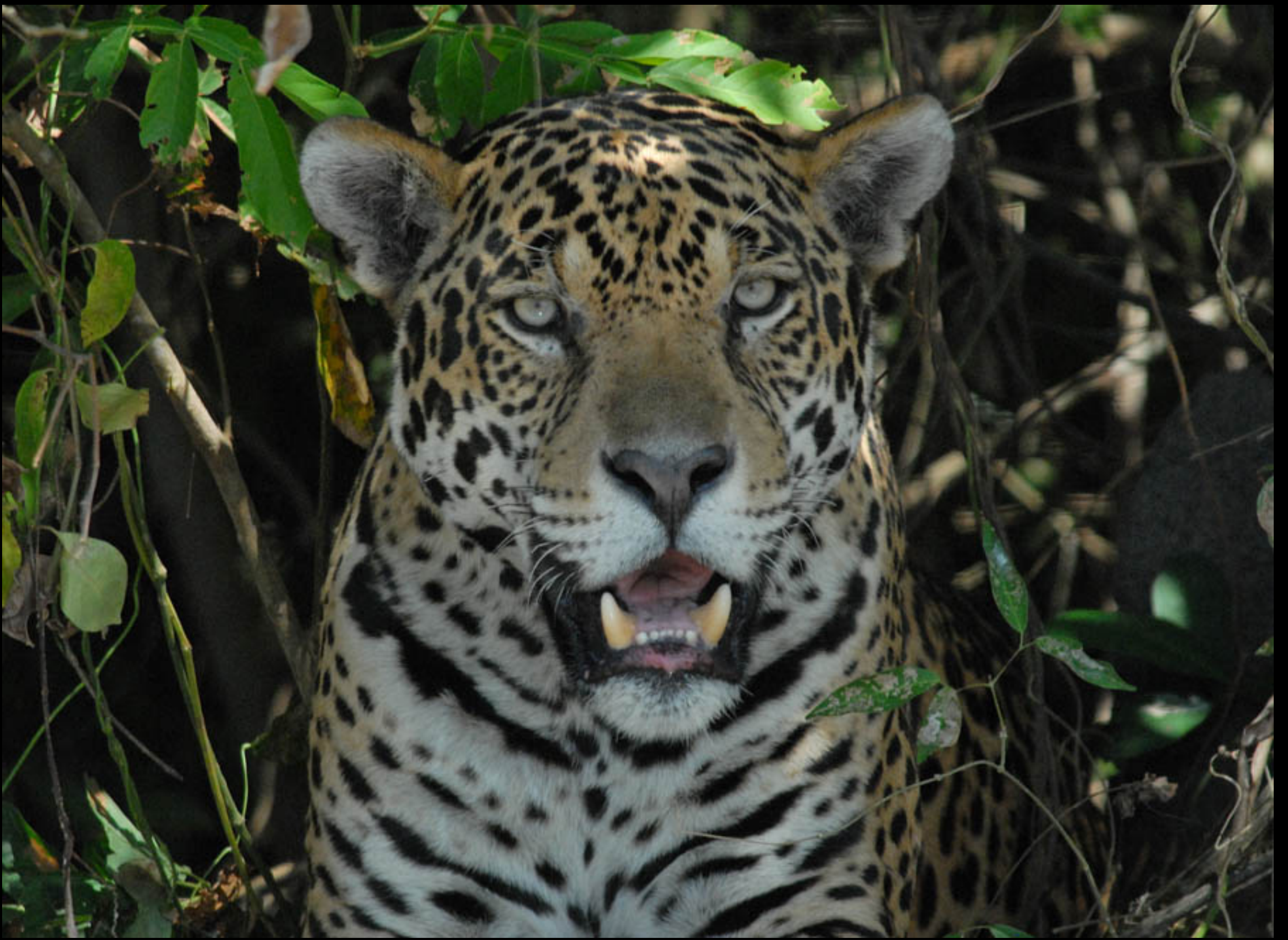
A Jaguar in the Lima, Peru zoo.

Friday, December 17, 2010
If habitat destruction can't be stopped, this may be the only view that future generations ever have of a Jaguar.
Parque de las Leyendas, Lima, Peru - 15 July 2009



Friday, December 17, 2010

Wilson – Rio Cuiabá – 04 July 2009



Friday, December 17, 2010

Wilson – Rio Cuiabá – 04 July 2009



Friday, December 17, 2010

Wilson – Rio Cuiabá – 04 July 2009



Degraded cattle pasture in the Pantanal.



Friday, December 17, 2010

“More than 40% of the forests and savanna habitats of the Pantanal have already been altered for cattle ranching....”

Above from: “Safeguarding the Pantanal Wetlands: Threats and Conservation Initiatives”, Harris *et. al.* 2005, *Conservation Biology*, 19 (3): 1-8]

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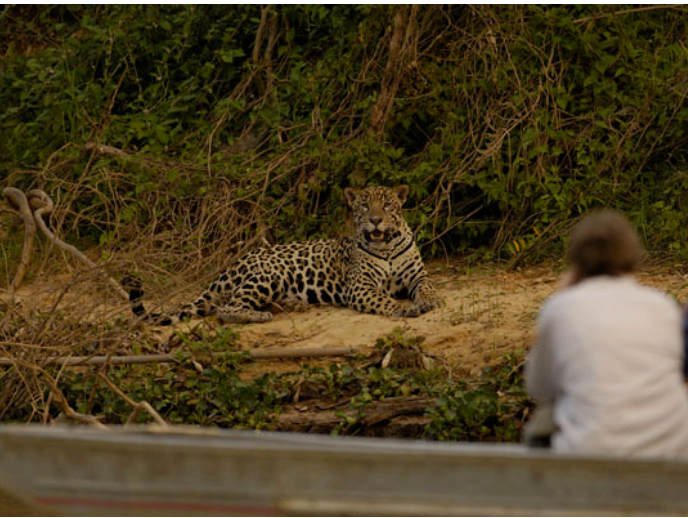
Fazenda Santa Tereza - April 2009 - photos by Teresa Wood



A Jaguar trail along the right bank of the Caxiri.

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- In the Pantanal, Jaguars will often hunt by walking along the river banks, looking for caiman, capybara, waterbirds, or whatever else they come upon.
- We found fresh Jaguar tracks here on 03 July 2009.



Jack rests, allowing several boatloads of visitors to observe him. He has been seen since 2007

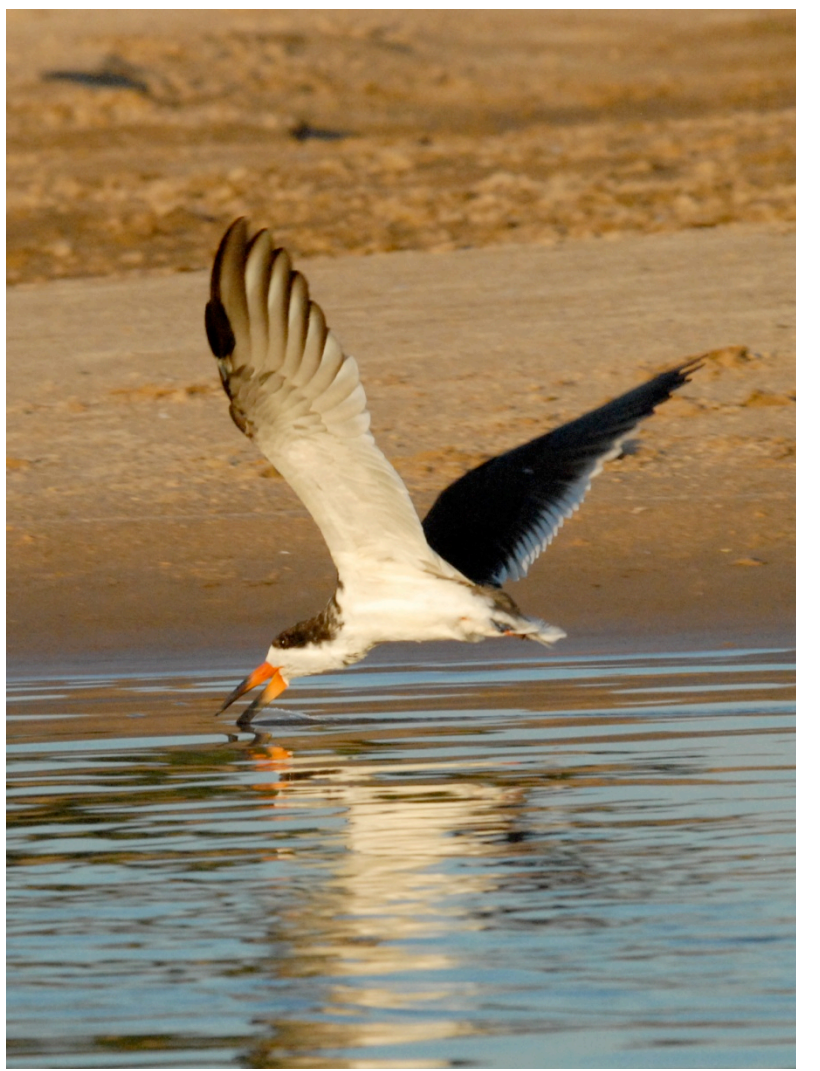


Wilson

Friday, December 17, 2010



Group of 4 jaguars seen on 4 August 2007



Photograph other animals for practice.

Thank you for visiting the Jaguar Research Center in the Pantanal of Mato Grosso



Friday, December 17, 2010

By your visiting the JRC, you have added value to Jaguars in the only place in the world where a live Jaguar is worth more than a dead one. Thank you for making the Jaguars of this region safe.

Conservation status

- Jaguar was listed on Appendix I, the highest level of protection, of the Convention on International Trade in Endangered Species (CITES) in 1973.
- It is legally prohibited in Brazil to kill a Jaguar, however, the law is not often enforced.
- Jaguars are protected through conservation areas and by living in inhospitable areas.



Friday, December 17, 2010



Friday, December 17, 2010



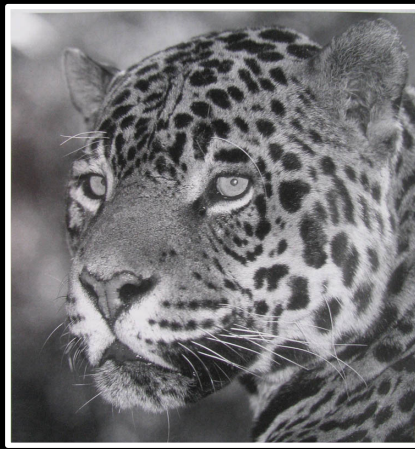




Friday, December 17, 2010



Distribution



- Northern distribution historically to Pennsylvania in USA. Last sighting in USA in Arizona in 1996. Its southern distribution has receded by 1000 kilometers in the last 50 years.
- Swank estimates its range has shrunk from 15 million square kilometers to 9 million square kilometers since European colonization.
- Tropical and subtropical habitats, generally up to 1,200 meters elevation.



Friday, December 17, 2010

Five thousand years ago, the Jaguar occurred as far north as the middle of the U.S. Since then, its range has shrunk by 40%, entirely due to persecution by hunters.

Jaguars and the Jaguar Research Center



Mato Grosso,

BRAZIL



Friday, December 17, 2010

Wilson along the Rio Cuiabá - 07 June 2009

Corixo São Pedrinho - June 2009



Jaguar Research Center: guests watching a Jaguar.....one of the tents in camp....one of the scout boats.... and the *Pira Miuna* houseboat which serves as the headquarters.

Friday, December 17, 2010

We moved to our current site in 2008 to be closer to the greatest concentration of Jaguar sightings.



Hanging Jaguar bait below the tree platform.

Friday, December 17, 2010

When activity at the rookery began to wind down for the season and the Jaguar was becoming less reliable, the decision was made to hang bits of meat below the tree platform.

The Jaguar caught on to the meat bait quite quickly. The idea worked a little too well!

Francisco hanging beef – 01 July 2007

Thank you for visiting the Jaguar Research Center
in the Pantanal of Mato Grosso, Brazil.



Friday, December 17, 2010

By your visiting the JRC, you have added value to Jaguars in the only place in the world where a live Jaguar is worth more than a dead one. Thank you for making the Jaguars of this region safe.

photo of Wilson, Rio Cuiabá, 07 June 2009.



- Home range in males: 28-40 square kilometers with extensive overlap.
- Home range in females: 10 square kilometers within the ranges of male jaguars.

Friday, December 17, 2010

You can see the home range size of Jaguars, based on many radio collaring studies for 20 years in most of the countries from Mexico to Argentina.

As you can see, males have ranges that are three to four times larger than females.

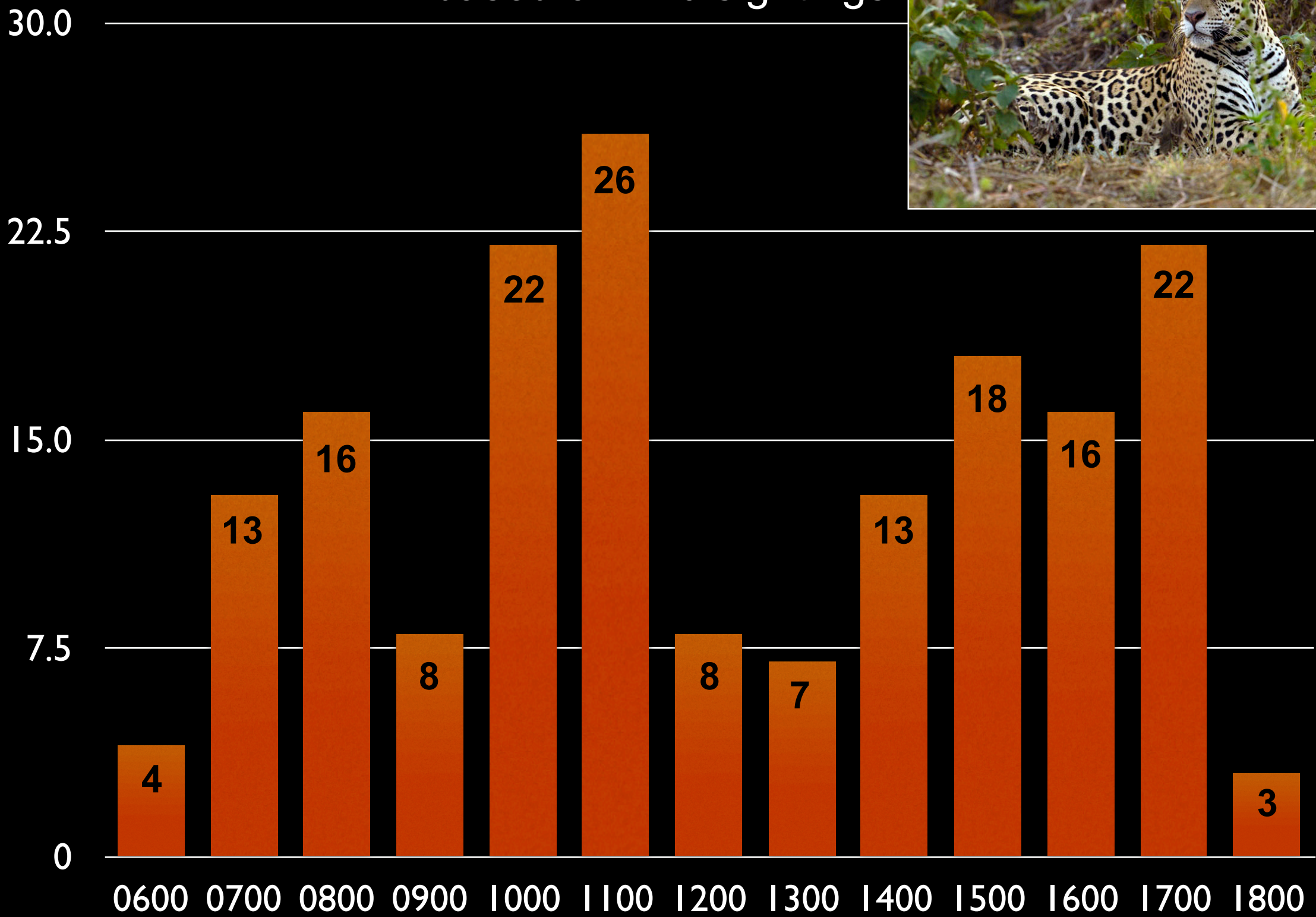
We have found this same pattern here with individual Jaguars that we know, but we have not used any radio collars to track them, as we can simply watch them directly without any problem.

Crawshaw and Quigley (1991) found that mean daily travel distance was significantly larger for a male (3.3+1.8 km) than for females (1.8+2.5 km). Both sexes tended to travel further each day during the dry season.

Rabinowitz and Nottingham (1986) found that radio-collared male jaguars tended to remain within small areas (average 2.5 km²) for a week at a time before shifting in a single night to other parts of their range.

Time of Initial Sighting - July through December 2008

based on 176 sightings



Friday, December 17, 2010

Hours are all in standard time, 24 hour format. You can see that 10 AM to noon and 5 PM to 6 PM are the times with the best chance of spotting a Jaguar.



- Young males disperse farther than females, with the female cubs remaining near their mother's range.
- Males reach sexual maturity at 3-4 years of age and females at 2 years of age.
- Males take a bit longer to reach sexual maturity than females, and can be 30-50% bigger than females.

TIME FRAME	EVENT
first 10-11 weeks	dependent on mother's milk
up to 5-6 months old	may continue to suckle
2 months old	cubs accompany mother
2 years of age	males may be 50% heavier than sisters
about 15-18 months old	offspring are traveling independently and making own kills
about 2 years of age	offspring is independent
16-20 months of age	dispersal to own range takes place
2-2.5 years of age	females are sexually mature
approx., but variable, 3-4 years old	males are sexually mature

Jaguars per boat-hour July-October 2008



- July: 330 boat hours, 32 Jaguars: (10.3 boat hours/Jaguar)
(0.097 Jaguars/boat hour)
- August: 420 boat hours, 50 Jaguars: (8.4 boat hours/Jaguar)
(0.12 Jaguars/boat hour)
- September: 669 boat hours, 48 Jaguars: (13.9 boat hours/
Jaguar) (0.072 Jaguars/boat hour)
- October: 273 boat hours, 32 Jaguars: (8.5 boat hours/Jaguar)
(0.12 Jaguars/boat hour)

Watching Jaguars

Jaguar encounters vary. Some visitors have seen a Jaguar briefly in excellent light, while other may have observed a Jaguar lying for several hours in deep shade under a tree. You do not want to miss any opportunity to take a reasonable picture of the jaguar when you see it. **It might be your only Jaguar sighting!**

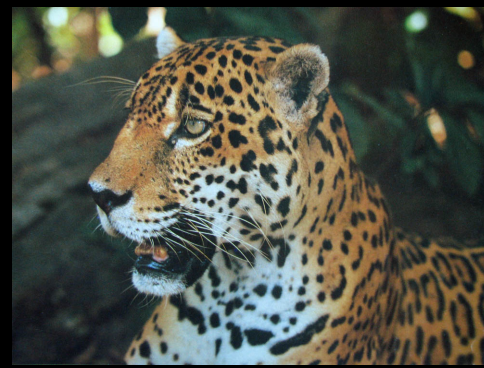
- ✓ ALWAYS have your camera ready (batteries, memory cards, right lens). You may have only 5 seconds to react.
- ✓ Take test photos of other things to prepare for the moment of truth.
- ✓ Use your binoculars to help spot Jaguars. They often sit camouflaged under trees and are truly hard to spot.
- ✓ If you suspect a Jaguar, don't hesitate to inform the guide and driver. False alarms are welcome.
- ✓ Stay calm and silent when a Jaguar is spotted.
- ✓ The boat driver decides how best to approach and how closely.
- ✓ Some Jaguars leave upon seeing a boat. Others stay.



Friday, December 17, 2010

Wilson along the Rio Cuiabá – 07 June 2009

Jaguar watching rules



- ▶ All boats are scout boats and are interlinked by radio communication.
- ▶ All boats will inform other scout boats about a Jaguar sighting and other groups may join you watching the Jaguar your boat found.
- ▶ You may be with another group during your outings unless you have specifically paid for private boat service.
- ▶ All guests have same right of Jaguar viewing. Camera size does not matter.
- ▶ Guest that have not yet seen a cat are given priority for the viewings.
- ▶ The boat driver decides how best to approach and how closely.