

A UNIFYING SYMBOL FOR WILDLIFE
CONSERVATION IN SOUTH AMERICA



ARMADILLO

MEDIA PACKET



The life of a field biologist is, for better or worse, mostly unglamorous – sometimes days, weeks or even months can go by searching for animals that seem to have vanished into thin air. Despite the huge improvements we've made over the years with survey techniques and equipment it somehow does not make finding giant armadillos any easier. For these reasons this incredible animal does not occupy the place it deserves on the conservation radar.

You might think that a big, armor-plated mammal with claws the size of kitchen knives would have attracted more attention, but when we began researching giant armadillos in 2010 they were still relatively unknown. With my colleagues in the Giant Armadillo Project, and thanks to the support of many other organizations including zoos across North America and Europe, we've spent the last four years learning everything we could about this fascinating animal. We have made some key discoveries on some basic facts (they only have one baby at a time) and on some of the more complex interactions they may have within the ecosystem (their deep burrows, when unoccupied, are used by over 25 different species as source shelter against predators, extreme temperatures or even as a place to find resources).

Sadly, as with so many other species, the giant armadillo faces worsening prospects due to human activity. Hunting, farming, and even South America's ever-expanding network of roads and highways are putting these creatures in harm's way, and we may be running out of time to study them. Scientific research for the sake of knowledge is a worthy cause, but for threatened species like the giant armadillo, we need to aim our research and our efforts toward conservation goals – and it starts with awareness. We are learning about this amazing creature in order to broadcast this knowledge to the world; to show our neighbors and everyone else how and why they should protect it for generations to come. We are extremely grateful to the EWCL Giant Armadillo Team for helping us achieve this.

The story of the giant armadillo is still being written, but we're discovering more, day by day, week by week, month by month, and the pages are beginning to fill.

– Dr. Arnaud Desbiez, Giant Armadillo Project founder

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EWCL

The Emerging Wildlife Conservation Leaders (EWCL) initiative brings together young professionals in the wildlife conservation field for capacity-building and intense training in campaign development and skills. This applied training includes the implementation of a two-year group international wildlife issue campaign.

EWCL's Giant Armadillo Team convened in 2013 and includes representatives from the United States, Kenya, and India. In partnership with Dr. Arnaud Desbiez and the Giant Armadillo Project, the Giant Armadillo Team is working to focus attention on their namesake species, a remarkable animal that has only recently begun to attain its rightful place in the public eye. Sharing characteristics with dinosaurs, anteaters, and groundhogs, the giant armadillo is rarely seen and poorly understood, but could prove to be a unifying symbol for wildlife conservation in South America, and particularly the vast, diverse, and threatened Pantanal region.

BACKGROUND

“Armadillo” means “little armored one” in Spanish, but this name doesn't fit one member of the family: The Giant Armadillo (*Priodontes maximus*) is one of the earth's most incredible living creatures, an armored tank with claws reaching twenty centimeters (eight inches) that somehow makes a living nibbling almost entirely on ants and termites. Tipping the scales at up to fifty kilograms (one hundred and ten pounds) and one and a half meters (five feet) in length, giant armadillos truly earn their name, yet they are among the least known and studied animals in modern zoology. While motorists from Texas to Buenos Aires are unfortunately familiar with the common Nine-banded armadillo, *Priodontes maximus* is only rarely encountered by scientists and locals despite its wide distribution across South America; naturally rare, these creatures are now threatened by habitat loss, hunting, fire, and other consequences of growing displacement due to human activity.

Fortunately, new efforts are being mounted to study this enigmatic species and better understand their ecological role so that we can learn how to protect them for generations to come. The EWCL Giant Armadillo Team, in partnership with the Giant Armadillo Project, is helping to advance the cause of armadillo conservation by spreading the word and working with zoos internationally to increase awareness through interactive activities and educational materials. With the 2014 FIFA World Cup kicking off in Brazil, organizers chose the indigenous Brazilian three-banded armadillo as its official mascot – which means that soccer fans from Rio to Rome are watching one of our favorite animals at the games, presenting a great opportunity for locals and foreigners alike to learn more about some of Brazil's true natural treasures.



Above: *Priodontes maximus* – the Giant Armadillo
Below: An aerial view of Pantanal region



The giant armadillo is considered an “eco-system engineer” because of the many ways its excavation efforts shape the local environment.

Armadillos are closely related to sloths and anteaters, and the three families together make up the taxonomic order Xenarthra. Xenarthrans share some characteristics with similar-looking creatures like armadillos and pangolins, such as less-developed teeth and unusually low body temperatures, and in fact used to be classified with those animals in the scientific group Edentata. However, we now know that this is due to “convergent evolution,” where different species develop similar traits to fit a particular niche, such as specialization in eating colonial insects.

Xenarthra species are only found in the New World (South and North America). The order Xenarthra contains two distinct groups: the Cingulata, containing all present day armadillos, and the Pilosa, which contains two subgroups – the Vermilingua or anteaters, and the Phyllophaga (or Folivora) or sloths.

Even though they come from the same branch of the genetic tree, it would be hard to mistake an armadillo for a sloth or an anteater for one obvious reason: the shell, or “carapace,” which covers most of an armadillo’s body. This carapace is made up of bony plates, called “scutes,” that are covered in skin and serve as armor against potential predators and the prickly underbrush through which they shuffle. When threatened, some species can bring their limbs inside the carapace and plunk themselves on the ground like a turtle, and some can actually roll up in a ball. It is an effective defense against jaguars in the forest, but can also make them easy prey for humans.

The second thing you notice when face to face with an armadillo is its claws. The giant armadillo and the four species of naked-tailed armadillos, in particular, have huge front claws that allow them to dig into termite and ant mounds in search of their favorite food, giving them the dietary description “myrmecophagous.” A giant armadillo’s primary claw can be as long as 20 cm (8 in). *Priodontes maximus* doesn’t just dig for its dinner like most armadillos; they also dig burrows. The giant armadillo is considered an “ecosystem engineer” because of the many ways its excavation efforts shape the local environment. There’s a tradeoff to having shovels on your hands, though: like trying to sprint in high heels, the big-clawed armadillos can have a hard time running away from threats. Fortunately, when you’re a 50 kilogram (110 lb) armored beast, that’s usually not a problem.

Their teeth are another interesting characteristic: armadillo teeth lack enamel, are peg-like, and ever growing, and the giant armadillo has the largest number of teeth (40 to 100) found in any mammal.

PREHISTORIC ARMADILLOS

Armadillos, unsurprisingly, are a genetic throwback whose lineage dates back as much as eighty million years, making them one of the earliest placental mammals. During the Pleistocene epoch (roughly 2.6 million to 11,700 years ago) huge armored glyptodonts—the forebears of armadillos—lumbered across the landscape, stalked by saber-toothed cats and (eventually) the continent's early human inhabitants, who used their shells as shelters. These animals were the size of a Volkswagen Beetle, reaching 3.3 meters (10 ft) in length. One species, the *Doedicurus*, even had a spiked tail that could be used to keep predators and competitors at bay. Glyptodonts lived throughout Central and South America and into North America, where they were found in the current U.S. states of Arizona, Texas, Oklahoma, Florida and South Carolina. But despite their bulk and fearsome appearance, glyptodonts were vegetarians, content to chew through piles of plants instead of steak.

Scientists think that a combination of climate change and human hunting probably led to the glyptodonts' extinction eleven thousand years ago, but their slightly smaller relative, the giant armadillo, lives on to remind us of those prehistoric behemoths.



Size comparison: man, prehistoric glyptodont, and current day armadillos

For species specific information please reference the [Armادillo Family Tree-Species Overview document](#)

There are twenty-one species of armadillos ranging from the biggest, *Priodontes maximus*, all the way down to the aptly-named Lesser fairy armadillo, which would fit in the palm of your hand with plenty of room to spare. All of them live in South and Central America and one – the nine-banded armadillo – makes its home in the United States too. Here are some interesting facts about each of these remarkable animals:

Genus *Priodontes*

Giant Armadillo *Priodontes maximus*

photo by Kevin Schafer



Giant Armadillo – *Priodontes maximus*

The giant armadillo has a light band of scutes that encircles the entire lower edge of their shell. This can sometimes cause confusion – a subspecies of the Southern naked-tailed armadillo (*Cabassous unicinctus*) has similar markings, so people will occasionally capture a *C. unicinctus* thinking that it's a juvenile *P. maximus*, keep it in captivity with the idea of selling it as a giant armadillo once it's fully grown – but it never does because it's another species! It would actually be easy to tell apart a juvenile *Priodontes* from a *Cabassous*, as the latter has a “naked” tail.

Genus *Dasypus* (Long-nosed armadillos)

Imagine if all of your friends had three brothers or three sisters who looked exactly like them. That's a bit what it's like for most armadillos of the genus *Dasypus*, whose females produce genetically identical pups (babies) – in the case of *Dasypus hybridus*, a litter can be 6-12 pups. Because of this unique adaptation *Dasypus* armadillos have been used in human medical research as subjects of study for multiple births, organ transplants, birth defects, and diseases such as leprosy, typhus, and trichinosis. Not only do they produce multiple identical births but they can also go through a process of diapause, or delayed implantation, to ensure they give birth at the most opportune time.



Nine-banded Armadillo *D. novemcinctus*

photo by Kevin Schafer

Nine-banded (common long-nosed) armadillo – *D. novemcinctus*

The Nine-banded armadillo would be a great Olympic athlete – it jumps 3-4 feet in the air when spooked, and can hold its breath underwater for up to six minutes. They are the only armadillo species currently expanding their range, due to their adaptability to a wide variety of habitats and human disturbance. In North America they are now filling the range of the long extinct species, *Dasypus bellus*. Although prolific throughout their range nine-banded armadillos have poor reproductive success in captivity.

Seven-banded (Brazilian lesser) armadillo – *D. septemcinctus*

Genus *Dasybus* (Long-nosed armadillos) *continued*

Greater long-nosed armadillo – *D. kappleri*

D. kappleri is the second largest armadillo species. Greater long-nosed armadillos can release a stinky, musky odor when threatened. Wild armadillos have a strong odor, whether they feel threatened or not, and defecate as a stress response - which adds to the bad smell.

Southern long-nosed armadillo – *D. hybridus*

D. hybridus go above and beyond on their reproductive uniqueness. They don't only have 4 identical offspring, they have 6 to 12 identical babies in their annual litter.

Hairy long-nosed armadillo – *D. pilosus*

D. pilosus lives in some of the highest altitudes of all armadillo species. To adapt to the cold habitat their body is covered in hairs.

Northern long-nosed armadillo – *D. sabanicola*

Yunga's Lesser Long-Nosed Armadillo – *D. yepesi*

Researchers are still trying to decide whether *D. yepesi* should be classified as a separate species, or whether these specimens fit within the genetic boxes already established for Nine-banded, Seven-banded, and Southern lesser long-nosed armadillos.

Genus *Zaedyus*

Pichi – *Zaedyus pichiy*

Pichi are the southernmost naturally occurring xenarthran species. They are the only known armadillo species to enter hibernation, and are also known to enter torpor, a semi-hibernation status. They are distinguishable from other armadillo species by the sharply pointed edge of their carapace.

Genus *Cabassous* (Naked-tailed armadillos)

Cabassous armadillos are nocturnal and look like smaller versions of *Priodontes*, with a dark brown carapace, short snout, and a slender tail with a reduction or lack of scutes. They are strongly fossorial (burrowing) and myrmecophagous (meaning they almost exclusively eat ants and termites). Females give birth to one pup per gestation cycle.



Southern Naked-tailed Armadillo *C. unicinctus*

photo courtesy of the
Giant Armadillo Project

Southern naked-tailed armadillo – *C. unicinctus*

Originally believed to be nocturnal, studies by Bonato et al. and the Giant Armadillo Project have revealed that the southern naked-tailed armadillo is in fact diurnal (active during daylight hours) in Brazil. However, it is nocturnal in other parts of its range, such as Colombia. This species is highly fossorial (burrowing).

Northern naked-tailed armadillo – *C. centralis*

Sometimes being a little stinky can work in your favor, it does for the Northern naked-tailed armadillo, not hunted for food due to local beliefs – but also its pungent odor.

Chacoan naked-tailed armadillo – *C. chacoensis*

Greater naked-tailed armadillo – *C. tatouay*

Genus *Euphractus*

Six-banded Armadillo *Euphractus sexcinctus*

photo by Kevin Schafer



Six-banded (Yellow) Armadillo – *Euphractus sexcinctus*

A familiar face in the zoo world. Six banded armadillos survive and breed well in captivity due to their largely omnivorous diet consisting of the insect favorites typical of armadillos, and also large amounts of fruit and plant matter. They have been known to prey upon animals as large as rats. This species is the only armadillo that can crack palm nuts with their jaws, and the only species documented trying to bite as a defense.

Genus *Chaetophractus* (Hairy armadillos)

Chaetophractus armadillos have long hairs sticking out of the scutes in their carapace, but not all armadillos covered in hair are considered “Hairy armadillos.” Some other genera, like *Chlamyphorus* (pink fairy), *Calyptophractus* (greater fairy), and *Zaedyus* (pichi), as well as *Dasyus pilosus*, also display this trait, but Hairy armadillos have a lot of it.



Screaming Hairy
Armadillo
C. vellerosus

photo by Laura Gruber

Andean (Bolivian) hairy armadillo – *C. nationi*

Andean hairy armadillos, as you might expect, live high in the Andes mountains – about 3 kilometers (2 miles) above sea level, on average – and are well-suited for the cold, low oxygen environment.

Screaming hairy armadillo – *C. vellerosus*

Screaming hairy armadillos are named that way for a reason: when threatened by a predator, they make a loud, high-pitched noise somewhere between a shriek and a bark. They are one of the only armadillos to have a loud and distinct vocalization. Screaming hairy armadillos are often found in zoos; they have a diet consisting of insects, small vertebrates, and vegetation. Plant consumption increases in winter months.

Large hairy armadillo – *C. villosus*

One of the most common armadillos found in Argentina, it tolerates cultivated and degraded habitats.

Genus *Tolypeutes* (Three-banded armadillos)

The two species of *Tolypeutes* armadillos are the only armadillos capable of rolling into a complete ball. Their head plate and tail match together like prehistoric puzzle pieces to keep predators and biting insects at bay. The toes of their hind feet are grown together with hoof-like nails, and they walk on the tip of the nails on their front feet. Their quick jerky locomotion gives them the appearance of a remote control toy. Unlike most armadillo species Three-banded armadillos do not dig burrows; they do, however, utilize the burrows of other species. *Tolypeutes* are genetically distinct from all other armadillo species, with fewer chromosomes per cell.

Southern Three-Banded Armadillo *T. matacus*

photo courtesy of the
Giant Armadillo Project



Southern three-banded armadillo – *T. matacus*

The most common armadillo to be found in captivity. There are breeding populations in Europe and North America.

Brazilian three-banded armadillo – *T. tricinctus*

The Brazilian three-banded armadillo is about to become an international icon due to the 2014 FIFA World Cup. Called “tatu bola” (“ball armadillo”) in Portuguese, this little guy was a perfect choice as the new mascot for the games. Although the one on your television screen is sporting a blue carapace and bright yellow body, the real animal is a more humble tan and brown.

Fairy armadillos, once thought to belong to the same genus have recently been separated into two genera, *Calyptophractus* (greater fairy armadillo) and *Chlamyphorus* (lesser fairy armadillo). Both species exhibit unique characteristics different from all other armadillo species. Entirely nocturnal and fossorial (burrowing), filling an ecological niche similar to that of a mole, they are rarely seen above ground. Their visual appearance drastically differs from that of any other armadillo species. The classic armadillo shell is greatly reduced on both species, as is the size of their ears and eyes which lack usefulness underground. Their underbodies are covered in fine white hairs and both species have an unusual hard plate on their rear end that is believed to assist in blocking the burrow entrance. Their diet consists of insects, worms, snails, roots, and other plant material.

Genus *Calyptophractus*

Greater fairy armadillo – *Calyptophractus retusus*

This species is restricted to loose, sandy soils necessary for burrowing, however this habitat is uncommon throughout their range resulting in a highly fragmented population. It is known to make vocalizations that sound similar to a human infant.

Genus *Chlamyphorus*

Lesser (Pink) fairy armadillo – *C. truncatus*

The smallest armadillo species, their full size is comparable to the length of a giant armadillo's primary claw! Similar in appearance to the greater fairy armadillo, the dorsal shell of the lesser fairy armadillo is almost separate from the body with a few attachment points at the head, spine and pelvis. The tip of the tail is diamond-shaped.

The plight of armadillos is a microcosm of the “Sixth Great Extinction,” the term experts have given to our current ecological crisis



THREATS TO ARMADILLOS

Armadillos, like many other animals, are facing the consequences of human actions. Climate change is altering ecosystems across the planet, of course, but a more direct threat is the heavy loss of habitat due to encroachment by ranchers, farmers, and communities. Vast stretches of the South American landscape have been clearcut or developed for human use over the last few decades, while an ever-expanding network of roads fragments armadillo habitat even further. Pollution from mines, agriculture, cities, and other sources puts additional strain on the delicate balance of nature. Capture of live animals for the exotic pet trade may also contribute to the problem. Armadillos are a common protein source for many cultures, where they are hunted for their meat. Their shells are also used in making charangos, a type of musical instrument often sold to tourists.

Poisoning is also probably responsible for Giant Armadillo mortality—as mentioned earlier, these animals are voracious eaters of ants and termites (they can sometimes destroy an entire mound in one feeding) so when farmers spray insecticide on the colonies they may inadvertently poison the next *Priodontes* to come along. Scientists are also investigating the effects of agricultural fumigations on other armadillos, as the agrochemicals eliminate the invertebrates upon which the armadillos depend.

The plight of armadillos is a microcosm of the “Sixth Great Extinction,” the term experts have given to our current ecological crisis—Planet Earth is hemorrhaging species at the rate of 17,000-100,000 every year, and we will probably lose about half of all plants and animals by the end of this century.

Despite the constant threats, some species of armadillo are doing relatively well, like the nine-banded armadillo, which has actually increased its range northward into the United



States and is even considered (by some people) to be a nuisance animal. *Priodontes maximus*, on the other hand, was rare to begin with and is having difficulty withstanding the increased pressures of development. Researchers believe that populations of *Priodontes* declined 50% in the 1990's, and the situation has not improved since then.

A giant armadillo being released by researchers

WHY ARE ARMADILLOS IMPORTANT?

Aside from the fact that they're fascinating animals in their own right, there are several good reasons to protect armadillos. Let's take *Prionodontes*: you might remember that we termed these animals “ecosystem engineers,” and if that sounds a bit grandiose, consider that dozens of animal species have been found to live in and around Giant Armadillo burrows. By digging, *Prionodontes* quite literally shapes the environment for itself and other creatures, aerates the soil to help plant growth occur, and provides important habitat for at least eighteen species of mammals, three species of reptiles, and three species of birds. [Mammals: agouti, bush dog, collared peccary, crab eating fox, crab eating raccoon, coati, feral pig, giant anteater, lowland tapir, nine banded armadillo, six banded armadillo, small rodents (more than 5 different species have been counted), southern naked tail armadillo, southern tamandua, tayra, ocelot, puma, white-lipped peccary. Reptiles: lizard species, tegu (black/golden), red foot tortoise. Birds: bare-faced curassow, jay, seriema.] The giant armadillo burrows and associated sand mounds are used by these species as foraging locations, resting spots, shelter, and a location to escape the heat and cold.

Giant armadillos are also an “indicator species” – the proverbial canary in the coal mine – and can give us a good sense of the overall health of the region. This is important not just for the animals who live there, but for the growing human population as well.

ARMADILLOS AND HUMAN HEALTH

Some species of armadillo can be particularly useful in helping us learn more about human diseases and other important research questions. In particular, nine-banded armadillos have proven to be irreplaceable in human leprosy research, for which they were extensively used in the 1970's. Nine-banded armadillos react similarly to humans when infected with leprosy. Their naturally low body temperature allows them to easily contract the disease. They have no natural cellular resistance to the disease and therefore do not compromise the results of experimental drug testing. Nine-banded armadillos have also been used to derive killed leprosy vaccines that were utilized in humans. Because nine-banded armadillos give birth to identical quadruplets every time they reproduce, these offspring offer us a unique ability to study various research techniques, in addition to leprosy research, on four genetically identical specimens.



Armadillo burrows are beneficial to a multitude of animals, such as this tamandua and its offspring



Armadillos can give us a good sense of the overall health of the region, which is important both for the animals and the humans who live there



Illustrations by Geraldo Franca Jr.

CULTURAL IMPORTANCE OF ARMADILLOS

Armadillos play a role in many native cultures, quite often in folk tales as a piece of furniture, oddly enough. The Lacandón Mayans tell a story of the first armadillos -- The chief Lacandón deity, Hachäkyum, invited two fire lords to a ceremony. As a practical joke Hachäkyum sat the fire lords on traditional benches, which he turned into armadillos that leapt into the air. The gods fell onto their rumps, while the armadillos fled into the bushes, becoming the first of their kind. The Tzotzil Mayans called the nine-banded armadillo as "tz'omol chon" ("stool animal"). The Sierra Popoluca people believe that the Earth Lord, Chane, lives underground in a paradise of nature, abundance, and happiness. He is the "Master of animals," using armadillos and turtles as chairs, snakes as his hammock, a jaguar as a bed, alligators as his canoe, and deer serve as his cattle. The

Chontal Mayans tell a story of a young man who gets lost while gathering firewood.

When he loses his way he enters the earth and is hosted by an elderly man and woman, while animals prepare a feast for him. In the story he is seated on an armadillo.



There are also some uncomfortable misconceptions about these burrowing animals. In Paraguay's Chaco region it is believed that six banded armadillos dig up graves to eat the bodies. This is most likely derived from observations of them eating carrion or even possibly during the time of the Chaco War when dead bodies were plentiful.

Many armadillo species are used in traditional medicines. The fat of six banded armadillos is thought to cure bruises, respiratory illnesses, skin infections, swelling, sore throats, burns and inflammation. Their tail is used to treat earaches and deafness, and their meat is consumed to ease bone pain. Nine banded armadillos are also used to remedy coughs, bronchitis, asthma, rheumatism, open wounds, appendicitis and concussions. (We should note that none of these cures have been substantiated by modern medicine.)

***Priodontes maximus* has, until now, been largely ignored by researchers, but the Giant Armadillo Project is conducting the world's first long-term study of this fascinating animal**

THE GIANT ARMADILLO PROJECT

Scientists have studied armadillos for decades, and much is known about some of the more common species. One branch of the family tree, however, has a pretty sparse encyclopedia entry: *Priodontes maximus*. A 50-kilo shell-covered mammal seems like it would have been given the gold treatment by researchers, but its rarity and isolation have kept it out of the limelight until recently.

Dr. Arnaud Desbiez and his colleagues are trying to change that. Since 2010 Dr. Desbiez has led the Giant Armadillo Project, which is conducting the world's first long-term study of this furtive species, with the ultimate goal of protecting *Priodontes* for generations to come. Key staff include Danilo Kluyber (project veterinarian), Gabriel Massocato (project biologist) and Renata Santos (consultant veterinarian). The team operates from a base camp at the Baía das Pedras ecotourism ranch in Mato Grosso do Sul, Brazil, in the heart of the "Pantanal" region.

The Pantanal covers parts of Brazil, Paraguay, and Bolivia, and is the world's biggest freshwater wetland: a vast, marshy ecosystem teeming with wildlife like the giant river otter, jaguar, maned wolf and the giant anteater. The area's unique character is due to precipitation; during the rainy season from October to March, this immense floodplain can reach water depths of as much as five meters (over sixteen feet) in places. Fish and other riverine species take over the landscape, only to be replaced with terrestrial species when the waters recede in April.

The GAP blends modern GPS and camera trap technology with old-fashioned tracking skills to find *Priodontes* and other, related species like giant anteaters, nine-banded armadillos and southern naked tailed armadillos. Desbiez's team often spends days in the bush searching for their quarry, and the work is not for people who need instant gratification: they have slogged through periods of up to 9 months without capturing any new individuals. The tags and collars can be unreliable in the ever-shifting conditions of the Pantanal, made even more so by the rough-and-tumble habits of this lumbering, burrowing beast.

Yet, slowly but surely, GAP researchers are filling in the blanks—with the first documented Giant Armadillo reproduction, detailed information about the species' travel patterns, life cycles, and other key behaviors and traits. The results of their research is sometimes astonishing: one male was found to have traveled far across an inundated floodplain, proving that even a wide and deep water barrier is surmountable for this resourceful creature. As Desbiez says, "Every armadillo teaches us more about these fascinating animals, every time we think we understand something, they show us the contrary. What an exciting animal to study."

Unfortunately, sometimes the easiest animals to find are the ones that are no longer alive. The GAP recently launched a roadkill monitoring project in partnership with the Lowland Tapir Conservation Initiative. The researchers have already found significant impacts to the region's wildlife, and hope to use the information to design strategies that reduce animal-vehicle collisions.

In addition to learning more about armadillo behavior, the GAP is looking at the species through the lens of epidemiology and Danilo Klyuber, the Project's lead Veterinarian, is particularly



Above: GAP researchers using telemetry devices to track and locate a giant armadillo
Below: Veterinary staff evaluating the health of an anesthetized giant armadillo



THE IMPORTANCE OF ARMADILLOS



With perseverance and a bit of luck, Kluyber could make a discovery that benefits not just armadillos but other wildlife and humans as well

interested in “zoonoses,” diseases that can be transmitted from animals to humans. Armadillos have slow metabolisms and low body temperatures, which may make them ideal carriers of diseases like Chagas disease, Leishmaniosis, Hansen's disease and Paracoccidiomycosis. Kluyber's work is geared toward gaining a better understanding of the overlaps between conservation and human health. Epidemiologists must consider numerous factors in their research—a disease may be compounded and influenced in subtle ways by elements as basic as location, the presence of other species, and much more – so in addition to giant armadillos, the GAP study includes six-banded, nine-banded, and southern naked-tailed armadillos along with giant anteaters and southern tamanduas (also known as lesser anteaters). With perseverance and a bit of luck, Kluyber could make a discovery that benefits not just armadillos but other wildlife and humans as well.

While Dr. Desbiez's staff ranges far into the wilds to find their quarry, they are not alone in the vast stretch of floodplain and forest. Relatively few people live in the Pantanal – perhaps a few million – but that is changing as the region's cities and industrial projects expand. With this encroachment comes conflict between humans and animals, and the GAP seeks to gain crucial knowledge before it is too late to halt the huge and growing threats to biodiversity.



An ocelot resting in an armadillo burrow in the daytime heat

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RECOMMENDED WEBSITES:

Giant Armadillo Project | giantarmadillo.org.br

Emerging Wildlife Conservation Leaders | wildlifeleaders.org

Pangolin Aardvark Xenarthra TAG website: | <http://bit.ly/1s85pj>

IUCN Anteater, Sloth & Armadillo Specialist Group | xenarthrans.org

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