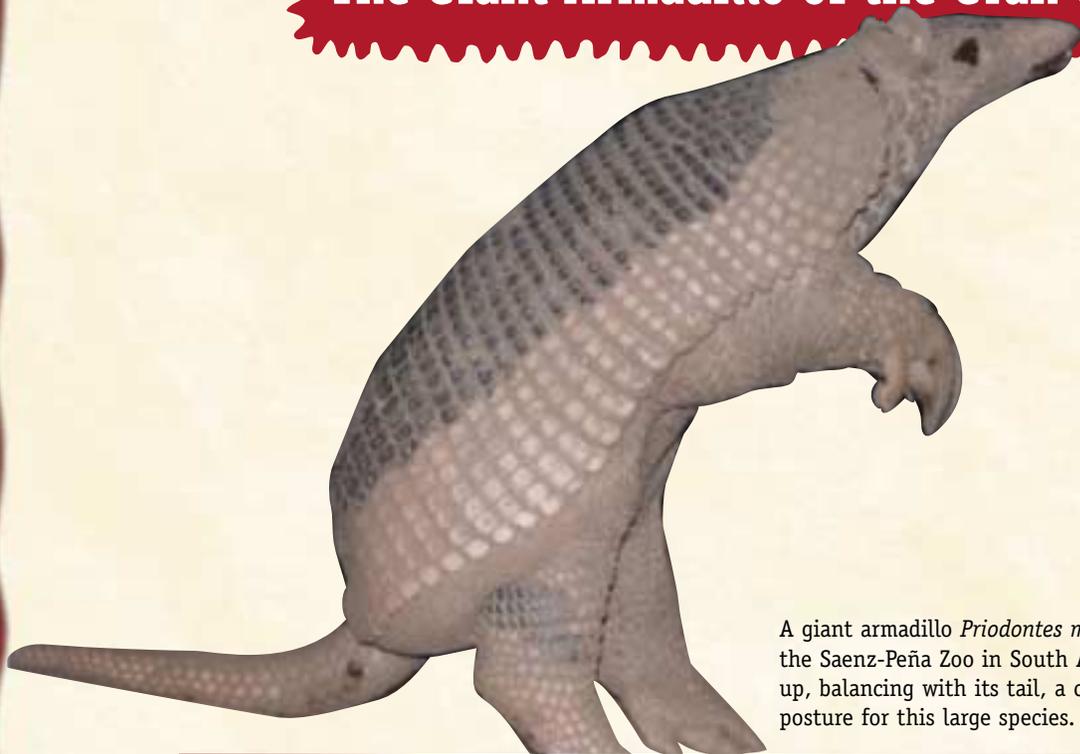


NAPAMALÓ

The Giant Armadillo of the Gran Chaco



A giant armadillo *Priodontes maximus* at the Saenz-Peña Zoo in South America raises up, balancing with its tail, a common posture for this large species.

What's the size of Texas and Arizona combined, reaches temperatures of 115 degrees Fahrenheit, has plants with 15-inch-long thorns, and houses an armadillo larger than a coffee table? The South American Gran Chaco, where giant armadillos wander freely. The Gran Chaco region covers more than 1 million square kilometers of Argentina, Bolivia, Paraguay, and Brazil, with approximately 60 percent in Argentina and just 7 percent in Brazil. The region is a mosaic of grasslands, savannas, open woodlands, dry thorn forests, and gallery forests that provide a range of habitats where some diverse animal species flourish.

In the gallery forests of the humid Chaco, we regularly encounter animals that are associated with tropical and subtropical forests, like jaguars, owl monkeys, howler monkeys, peccaries, deer, tapirs, and various kinds of edentates, a group of mammals that includes sloths, anteaters, and armadillos. Although there are no sloths in the Chaco, we regularly find lesser anteaters and sometimes come across giant anteaters. Both the nine-banded armadillo, also found in Texas, and the *tatu bola*, or three-banded armadillo, which you can see at the Wild Animal Park's Animal Care Center and the San Diego Zoo's Children's Zoo, are frequently seen in the Chaco. But what you will never see in the humid eastern Chaco is the armored king: the giant armadillo. For that, you must travel several hundred miles to the dry western Chaco.



The Gran Chaco—from the Quechua Indian language of Bolivia for “great hunting ground”—crosses four countries and encompasses an area the size of Texas and Arizona combined. Besides the Gran Chaco, giant armadillos are also found in Venezuela, Colombia, Perú, and the Guianas.

Story and Photos by Eduardo Fernandez-Duque, Ph.D., Millennium Postdoctoral Fellow, Center for Reproduction of Endangered Species(CRES), and **Natalia Ceresoli**, Research Associate, Fundación Ecosistemas del Chaco Oriental, Formosa, Argentina



Author Dr. Eduardo Fernandez-Duque shows how big a giant armadillo can be, up to 5 feet long and weighing 130 pounds.

In searching for these plated giants, one of the most endangered mammals of South America, we travel 300 miles west from the owl monkey field site, where another project supported by the Zoological Society of San Diego takes place (see ZOO NOOZ, November 2002, and the San Diego Zoo's Web site at sandiegozoo.org/conservation/millennium_owlmonkey.html). For each mile, the terrain gets

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one-half inch less of rain per year, which means that by the time we reach giant armadillo territory, we're in the middle of the dry Chaco, with cacti everywhere and thorns that can go through truck tires. That's when the search for the giant armadillo starts. One needs lots of patience, patience, and even more patience, because finding giant armadillos is no easy task.

The giant armadillo project is part of the Society's long-term commitment to conservation of the Gran Chaco of Argentina. In July of 2002, I joined efforts with Natalia Ceresoli, an Argentinean biodiversity graduate working at Fundación ECO of Formosa in Argentina, on my first trip to explore the region.

The owl monkey research leaves few opportunities for anything else, so I had to wait until the winter holidays for a chance to explore. That turned into a family trip, and quite a memorable one. I spent one week wandering over 35,000 hectares (86,000 acres) of dry Chaco owned by Toba Indians, bird-watching with my sons, driving my pregnant wife to the nearest phone to find out the gender of our third child, celebrating my birthday, meeting the Toba Indian chief for the first time, and seeing my first giant armadillo burrow. What an experience—an unforgettable week!

For most people, it comes as a surprise to learn that there are Indians living in Argentina. The Indian population is approximately 300,000, and most of them live in the Gran Chaco. The cultural diversity of the Gran Chaco region is unparalleled, since there are currently 17 recognized indigenous nations in the Argentine Gran Chaco alone, the Toba Indians being one of the largest. Our research takes place in an area where there are 12 Toba communities ranging in size between 100 and 600 people. The groups were traditionally nomadic or seminomadic hunter-gatherers, and as much as 75 percent of the diet of western Toba people still comes from hunting, fishing, or gathering. After years of wandering the forests in search of game, they know better than anyone else where to find the *naɣamaló*, their name for the giant armadillo.

Our armadillo field project began in the village of Vaca Perdida (meaning, oddly enough, "lost cow"), where we established camp. A few days later I met the chief, Carlos Ortiz, and he briefed the governing



At birth, armadillos do not have the protective shells that will harden later—instead, their skin is leathery and pliable. This 21-day-old three-banded armadillo pup shows the early development of its shell.



Graduate students arrive for giant armadillo feeding time at the Saenz-Peña Zoo. These are currently the only two giant armadillos in captivity in the world.

council about our plans. They approved of our presence and authorized us to begin research. Then he offered to show me two burrows. The first one looked quite old, but the second one was incredible. The shell had so clearly shaped the contour of the entrance that I could almost "see" the animal walking into the burrow. Both burrows had been dug out of large ant nests, which are common in the Chaco.

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During the next several months, we continued organizing our fieldwork. The chief identified suitable local assistants in each of the 12 communities who could search for giant armadillo burrows. Finding the giant armadillos requires exploration of vast areas in collaboration with knowledgeable local guides. They have identified 19 burrows so far, and the exact location of each one has been recorded with GPS equipment. When you read this, we will be in the process of setting up automatic cameras to capture photos of the animals when they move in and out of the burrows, and to monitor those burrows using night-vision goggles and/or other photographic equipment.

We are also hoping to begin research with the only two captive giant armadillos in the world, which live at the Saenz-Peña Zoo in Chaco Province. In collaboration with Dr. Valentine Lance of the Endocrinology Division and Dr. Oliver Ryder of the Genetics Division of the Zoological Society of San Diego's Center for Reproduction of Endangered Species (CRES), urine and DNA samples will be collected to characterize the reproductive status and the karyotype of this endangered species. This knowledge can then be applied to our continuing work with giant armadillos in the Chaco. Ultimately, we hope to learn more about the social organization and reproductive behaviors of these odd but extraordinary animals, in the hope that they will still be trundling through the thorn forests many years into the future. Z



Uno, dos, tres—a trio of rolled-up three-banded armadillos is measured by graduate students.

COME FOR SPECIAL SPEAKERS
On September 17, Dr. Eduardo Fernandez-Duque will share his incredible experiences studying the giant armadillo. Special Speakers presentations are from 7 to 8:30 P.M. in the Zoo's Otto Center auditorium and include cookies and a hot beverage. The program fee is \$12 per person for ages 12 and up. Reservations are required, please call (619)557-3952.