

from Bolivia to date, all of which Anderson (1997) ascribes to the subspecific form *C. u. squamicaudis* (Lund, 1842).

On 3 March 2001, at 14:00 hrs, an adult female was observed walking across the unpaved road that runs from San Jose de Chiquitos to Tucavaca Field Camp (Bolivia-Brazil gas pipeline), in the Department of Santa Cruz at 18°05.723'S, 60°49.996'W (378 m asl). No measurements could be taken, nor were any special features evident (Fig. 1). The vegetation of the area is Chiquitano transitional forest—dry forest transitional between the Chaco and Cerrado biogeographical provinces. Annual precipitation is 800 mm and the average annual temperature is 26°C.

This sighting is a new locality for this species, and extends its known distribution more than 300 km to the southeast towards the Bolivian border with Paraguay (Fig. 2).

*Acknowledgements:* Thanks to the American Museum of Natural History Library for permission to modify and reproduce Fig. 2, originally published as Fig. 514 from Anderson (1997).

Leonardo Maffei, Casilla 3800, Santa Cruz, Bolivia.

## Reference

Anderson, S. 1997. Mammals of Bolivia, taxonomy and distribution. *Bull. Am. Mus. Nat. Hist.* (231): 1–652.

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## NEWS

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### Edentates in the 2006 IUCN Red List

The *IUCN/SSC 2006 Red List of Threatened Species* was launched online in May 2006, covering a total of 16,119 species categorized as Vulnerable, Endangered or Critically Endangered. There are now 784 species officially considered to be Extinct, with an additional 65 which exist only in cultivation or captivity. In 2003, by comparison, the Red List included 12,259 species threatened with extinction, with 762 officially extinct and 58 lost from the wild.

In addition to its broad coverage of terrestrial species, the 2006 Red List added assessments of selected

marine species, in particular the sharks and rays, of which at least 20% are threatened with extinction. Freshwater fish are in a far worse situation—of 252 species endemic to the Mediterranean region, a full 56% are now classified in threatened categories. A total of 7,725 animal species are now recognized as threatened, including 12% of birds, 32% of amphibians and 42% of turtles and tortoises.

Of the 4,856 mammal species assessed, 1,093 (23%) were classified as threatened with extinction, of which 583 are Vulnerable, 348 are Endangered and 162 are Critically Endangered, with an additional 70 Extinct and four Extinct in the Wild. The edentates, fortunately, contribute very little to these ominous totals: only six species are threatened, with another seven species classified as Near Threatened, two as Data Deficient, and 16 as Least Concern.

The most recently described edentate, the pygmy sloth *Bradypus pygmaeus*, is by far the most threatened, now classified as Critically Endangered. The maned sloth (*Bradypus torquatus*) remains Endangered, while *Chaetophractus nationi*, *Dasybus pilosus*, *Priodontes maximus* and *Tolypeutes tricinctus* are considered Vulnerable. Several species were downgraded from their prior status: the pink fairy armadillo (*Chlamyphorus truncatus*) changed from Endangered to Near Threatened, the giant armadillo (*Priodontes maximus*) moved from Endangered to Vulnerable, and both the giant anteater (*Myrmecophaga tridactyla*) and the greater fairy armadillo (*Chlamyphorus retusus*) shifted from Vulnerable to Near Threatened. Some of these changes resulted from application of the most recently revised Red List criteria (IUCN, 2001) and may not reflect actual improvements to conditions in the wild.

These most recent assessments are the result of the 2004 Edentate Species Assessment Workshop, led by Dr. Gustavo Fonseca and with expert contributions from Agustín Abba, Teresa Anacleto, Adriano Chiarello, Erika Cuéllar, Paula Lara-Ruiz, Jim Loughry, Dennis Meritt Jr., Flávia Miranda, Gustavo Porini, Anthony B. Rylands, Rafael Samudio Jr., Mariella Superina and Sergio Vizcaíno.

**Craig Hilton-Taylor**, Red List Programme Officer, Species Survival Programme, 219c Huntingdon Road, Cambridge CB3 0DL, UK, **Gustavo A. B. da Fonseca** and **John M. Aguiar**, Center for Applied Biodiversity Science, Conservation International, 1919 M Street NW, Suite 600, Washington, DC 20036, USA.

**TABLE 1.** Conservation status and main threats to the extant edentates, based on the 2004 Edentate Species Assessment Workshop and the 2006 IUCN/SSC Red List of Threatened Species. All species have been assessed against the 2001 IUCN criteria.

Species	1996 Status	2006 Status	Primary Threats
<i>Bradypus pygmaeus</i>	NE	CR B1ab(i,ii,iii)	hunting, minimal range
<i>Bradypus torquatus</i>	EN A1cd	EN B1ab(i,ii,iii)	population fragmentation
<i>Bradypus tridactylus</i>	LR	LC	hunting, habitat loss
<i>Bradypus variegatus</i>	LR	LC	hunting, habitat loss
<i>Cabassous centralis</i>	DD	DD	habitat loss and degradation
<i>Cabassous chacoensis</i>	DD	NT	hunting, habitat loss
<i>Cabassous tatouay</i>	LR/nt	LC	hunting, habitat loss
<i>Cabassous unicinctus</i>	LR	LC	hunting, habitat destruction
<i>Chaetophractus nationi</i>	VU A1d	VU A2d	intense hunting and habitat loss
<i>Chaetophractus vellerosus</i>	LR	LC	hunting
<i>Chaetophractus villosus</i>	LR	LC	hunting
<i>Chlamyphorus retusus</i>	VU A1c	NT	intense persecution, habitat loss
<i>Chlamyphorus truncatus</i>	EN A1abcd	NT	habitat loss
<i>Choloepus didactylus</i>	DD	LC	hunting, habitat loss
<i>Choloepus hoffmanni</i>	DD	LC	habitat loss
<i>Cyclopes didactylus</i>	LR	LC	habitat loss
<i>Dasybus hybridus</i>	LR	NT	intense hunting and habitat loss
<i>Dasybus kappleri</i>	LR	LC	unknown
<i>Dasybus novemcinctus</i>	LR	LC	hunting
<i>Dasybus pilosus</i>	VU B1+2c	VU B1ab(iii)	habitat loss
<i>Dasybus sabanicola</i>	DD	LC	hunting
<i>Dasybus septemcinctus</i>	LR	LC	unknown
<i>Dasybus yepesi</i>	NE	DD	unknown
<i>Euphractus sexcinctus</i>	LR	LC	hunting, habitat destruction
<i>Myrmecophaga tridactyla</i>	VU A1cd	NT	hunting, fire, highway mortality, habitat loss, persecution
<i>Priodontes maximus</i>	EN A1cd	VU A2cd	hunting, habitat loss
<i>Tamandua mexicana</i>	LR	LC	fire, habitat loss, highway mortality
<i>Tamandua tetradactyla</i>	LR	LC	fire, hunting, habitat loss, highway mortality
<i>Tolypeutes matacus</i>	LR/nt	NT	hunting, habitat loss
<i>Tolypeutes tricinctus</i>	VU A1bcd	VU A2bc	hunting, habitat loss
<i>Zaedyus pichiy</i>	DD	NT	hunting, habitat loss and degradation

## References

- IUCN. 2001. *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.
- IUCN. 2006. *2006 IUCN Red List of Threatened Species*. <<http://www.iucnredlist.org>>. Downloaded on 5 May 2006.

## The Aviarios Sanctuary



Aviarios del Caribe was created by Luis Arroyo and Judy Avey-Arroyo in 1972 with the purpose of protecting 96 hectares of lowland tropical rainforest on the Caribbean

coast of Costa Rica. We rescued our first orphaned infant sloth in 1992. Since then our focus has been primarily on rescuing and caring for both kinds of sloths native to Costa Rica, *Bradypus variegatus* and *Choloepus hoffmanni*.

This interest was born not just from the curiosity and admiration sloths inspire in those who take the time to truly understand them, but more importantly because of the lack of information available on them, despite their remarkable ability to adapt and survive from prehistoric times. Over the years, as we grew and expanded our focus, the rescue center became known as the Aviarios Sanctuary.

The sanctuary also responded to the need to educate people about these animals, and to protect sloths from

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a variety of threats caused by human intervention. As word got around, more and more sloths were brought to the center: baby sloths falling from their mothers, or orphaned because their mothers were killed—hit by cars, stoned or beaten by people, attacked by dogs, or electrocuted when crossing power cables—as well as adult sloths that managed to survive such horrific accidents, but were in need of medical attention, food, rehabilitation, and/or long-term care.

Through the years we have compiled a considerable amount of new information on sloth habitat, behavior, nutrition, anatomy, physiology, pathologies and reproduction, gathered from our own experience—much of it trial and error—as well as feedback from others working with this remarkable animal. All of this gives us a great amount of practical and theoretical knowledge on both species of sloth found in Costa Rica.

Our successes have encouraged us formulate a new plan in our work with sloths: to become the first sloth sanctuary focused on rescue, research and education. Our mission and vision are:

*Mission:*

“To consolidate our Sanctuary as an agency that promotes and implements the protection and rehabilitation of sloths in Costa Rica, through the observation, study, care and analysis of animals in recovery; to promote actions that raise people’s awareness and to facilitate education in order to improve the welfare and quality of life of these two species.”

*Vision:*

“To be an integrated agency operating for the protection and rehabilitation of sloths, especially through study, research and exchange of knowledge that permits the development of scientific information on the species; to promote educational actions on the importance of sloths in our habitat.”

Our general objectives are, first and foremost, to rescue and rehabilitate sloths with special needs that are referred to our sanctuary, and to explore every alternative to improve their welfare and quality of life. Although many adult sloths have been reintroduced to the wild, we cannot do the same for the orphaned infants which we rescue and hand-raise. Until we are able to teach them how to survive in the wild as well as a mother sloth, we must consider alternative solutions, such as placing them on loan to qualified institutions, either in Costa Rica or other countries, as ambassadors for the rainforests of the Neotropics.

In addition, we will continue to study the behavior, lifestyle, physiology and pathology of sloths through research and the exchange of information. We hope to promote respect for sloths among people near and far, and we disseminate information on their importance to our environment, stimulating scientific and social interest in them with the support of those organizations involved in, and responsible for, environmental protection. In particular, we are working to expand our school-aged environmental education program to include children not only from our immediate area, but from throughout Costa Rica and beyond, in order to bring a greater understanding of and admiration for these extraordinary and fascinating animals to the future generations of our world.

We have invested considerable material and human resources into this purpose, and today, on the southern Caribbean coast of Costa Rica, we have 96 hectares of privately owned and protected primary and secondary forest, plus a building housing a medical clinic, nursery, a laundry room and a kitchen for the preparation of the sloths’ special diet. We also have a separate building with an area for community outreach and educational activities, and, most importantly, the resident *Bradypus* and *Choloepus* sloths that need us—and teach us—every single day.

Over the years we have received many other animals as well, which we have cared for to the best of our abilities. Some of these animals have been successfully released into the wild; others have died or have been relocated to other rehabilitation centers. We have treated two other species of edentates, the silky anteater (*Cyclopes didactylus*) and the northern tamandua (*Tamandua mexicana*). Other species of mammals which have been brought to us include the mantled howler monkey (*Alouatta palliata*), olingo (*Bassaricyon gabbi*), kinkajou (*Potos flavus*), jaguarundi (*Herpailurus yagouaroundi*), margay (*Leopardus wiedii*), ocelot (*Leopardus pardalis*), Mexican hairy porcupine (*Coendou mexicanus*) and paca (*Agouti paca*). We have also cared for a number of tropical birds, including rainbow-billed toucan (*Ramphastos sulfuratus*), chestnut-mandibled toucan (*Ramphastos swainsonii*), collared aracari (*Pteroglossus torquatus*), pomerine jaeger (*Stercorarius pomarinus*), parasitic jaeger (*Stercorarius parasiticus*), brown pelican (*Pelecanus occidentalis*), and slaty-tailed trogon (*Trogon massena*). At this writing, one rainbow-billed toucan and four kinkajous are still in residence with us.

Much still needs to be done. The clinic is in desperate need of essential veterinary equipment, from basic

**TABLE 1.** Number of animals received from 1990 to December 31, 2005. (Numero de animales recibidos desde 1990 hasta 31 diciembre 2005.)

Year (Año)	<i>Choloepus hoffmanni</i>	<i>Bradypus variegatus</i>	Other (Otros)	Total For Year (Total en el año)
1990	0	0	1	1
1992	2	0	0	2
1994	0	1	0	1
1995	0	0	2	2
1996	1	0	2	3
1997	2	1	1	4
1998	6	0	0	6
1999	4	3	3	10
2000	9	4	1	14
2001	9	2	0	11
2002	13	8	2	23
2003	17	4	2	23
2004	23	10	2	35
2005	37	13	13	63
<b>Total</b>				<b>198</b>

**TABLE 2.** Total population of animals in the sanctuary as of December 31, 2005. (Población total de animales en el santuario hasta 31 diciembre 2005.)

Species (Especie)	Quantity (Cantidad)
<i>Choloepus hoffmanni</i>	60
<i>Bradypus variegatus</i>	15
Miscellaneous other (mammals and birds)	5

supplies—stethoscopes, overhead lamps, surgical scissors—to expensive devices such as autoclaves, centrifuges, and ultrasound and hemogram machines. In the immediate future we will develop a protocol for universities and researchers from around the world who would be interested in joining our medical team to carry out research and education projects at the sanctuary. We are committed to our continuing education of the public, and to sharing information on our progress so that our mission and vision become a reality.

We invite anyone interested in learning more about our project or sharing their experiences in the management of sloths to contact us: **Judy Avey-Arroyo**, Project Director, and **Francisco Arroyo Murillo**, Chief Veterinarian, Aviarios Sanctuary, 1 Km. Norte Puente Río Estrella, Penshurt, Limón, Costa Rica, or P. O. Box 569-7300, Limón, Costa Rica. E-mail: <aviarios@costarica.net>.

## Una Introducción a Aviarios Sanctuary



Aviarios del Caribe fue creado por Luís Arroyo y Judy Avey-Arroyo en 1972 con el propósito de proteger 96 hectáreas de bosque tropical lluvioso de la costa caribeña de Costa Rica. En 1992 rescatamos al primer huérfano perezoso infante. Desde ese momento nos hemos enfocado principalmente en el rescate y cuidado de las dos especies de perezoso propias de Costa Rica, el *Bradypus variegatus* y *Choloepus hoffmanni*.

El interés nació no sólo de la ternura y la inspiración que producen estos seres vivos para quienes se toman el tiempo de apreciarlos verdaderamente; si no sobre todo de la falta de información que existía con relación a ellos a pesar de ser una especie con antecedentes históricos de adaptación y permanencia admirables. El centro de rescate se empieza a conocer como Aviarios Sloth Sanctuary (Aviarios, Santuario de Perezosos). El santuario también responde a la necesidad de educar a las personas acerca de estos animales y de proteger a los perezosos de las diferentes amenazas, especialmente relacionadas con la intervención del ser humano.

Con el pasar del tiempo han sido más y más el número de animales referidos (ver Tabla 1); bebés que caen de su madre o huérfanos a causa de la muerte de madres atropelladas, agredidas a pedradas por personas, atacadas por perros o electrocutadas por cables eléctricos, además de los adultos que sobreviven estos acciden-

tes y requieren de atención médica, alimentación y cuidados.

A través de los años hemos recopilado cantidades considerables de información nueva acerca del hábitat, comportamiento, nutrición, anatomía, fisiología, patologías y reproducción, aprendido por experiencias propias—generalmente a prueba y error—así como la retroalimentación con otras personas que han trabajado con estos maravillosos animales. Esto nos brinda un gran conocimiento teórico y práctico acerca de ambas especies para compartir.

Nuestro éxito en el trabajo con estos animales nos ha impulsado a reformular nuestra propuesta de trabajo para con los perezosos de una forma integral, constituyéndonos como el primer centro de perezosos enfocado en los temas de rescate, investigación y educación con la siguiente misión y visión:

*Misión:*

“Que nuestro santuario se consolide como un ente promotor y ejecutor de la protección y rehabilitación del perezoso en Costa Rica; mediante la observación, el estudio, cuidado y análisis de los animales en recuperación. Para promover procesos de concientización social y educativa en pro del bienestar y calidad de vida de estas especies.”

*Visión:*

“Ser un centro integrado trabajando en la protección y rehabilitación de perezosos, especialmente mediante el estudio, la investigación e intercambio de conocimientos que permitan el desarrollo científico de estas especies. A la vez que se promueven procesos de educación e importancia de los perezosos en nuestro hábitat.”

Nuestros objetivos generales son, en primer lugar, rescatar y rehabilitar los perezosos referidos al Aviarios Sanctuary con necesidades especiales y activar diferentes alternativas de ambiente que promuevan su bienestar y calidad de vida. Aunque se han reintroducido muchos perezosos adultos a su hábitat natural, no podemos hacer lo mismo con los perezosos huérfanos que rescatamos y criamos artificialmente. Hasta poder enseñarles a sobrevivir en estado silvestre, tenemos que considerar alternativas—como entregarles en préstamo a instituciones calificadas, sea en Costa Rica u otros países, para que sean embajadores del bosque tropical lluvioso del Neotrópico.

Adicionalmente, seguiremos estudiando el comportamiento, estilos de vida, fisiología y patología de los perezosos mediante la investigación, recolección de

datos e intercambio de conocimientos. Esperamos poder promover el respeto hacia los perezosos en el ser humano, y damos a conocer su importancia histórica en nuestro medio ambiente incentivando el interés científico y social hacia ellos, con el apoyo de los diferentes organismos involucrados y encargados de la protección ambiental. En especial, estamos trabajando para extender nuestros programas de educación ambiental para alcanzar no solo a los niños de áreas cercanas, sino de todo Costa Rica y el mundo para así tener un mayor entendimiento y admiración hacia estos extraordinarios y fascinantes animales en las futuras generaciones.

Para el cumplimiento de los mismos hemos invertido recursos materiales y humanos contando hoy en día en la costa caribeña sur de Costa Rica con un total de 96 hectáreas de bosque primario y secundario protegido, una clínica para la atención médica y cuidados especiales, y una cocina para la preparación de la dieta especial de los perezosos, además de un espacio para la proyección comunitaria y educativa y lo más importante, los *Bradypus* y *Choloepus* que residen en el centro que nos necesitan—y nos enseñan—día a día.

En los últimos años también hemos recibido muchas otras especies de animales que hemos cuidado lo mejor que pudimos. Algunos de esos animales fueron liberados exitosamente; otros murieron o fueron trasladados a otros centros de rehabilitación. Cuidamos de otras dos especies de edentados, el cílope (*Cyclopes didactylus*) y el tamandú (*Tamandua mexicana*). Otros mamíferos que fueron llevados a nuestro centro incluyen monos aulladores (*Alouatta palliata*), olingos (*Bassaricyon gabbi*), micos de noche (*Potos flavus*), yaguarundíes (*Herpailurus yagouaroundi*), tigrillos (*Leopardus wiedii*), ocelotes (*Leopardus pardalis*), puercos espín (*Coendou mexicanus*) y pacas (*Agouti paca*). También hemos cuidado de varias especies de aves tropicales, incluyendo tucanes (*Ramphastos sulfuratus* y *R. swainsonii*), arasaris collarero (*Pteroglossus torquatus*), págalos pomarinos (*Stercorarius pomarinus*), págalos parásitos (*Stercorarius parasiticus*), pelícanos (*Pelecanus occidentalis*), y trogones grandes (*Trogon massena*). Al momento de escribir esta nota, siguen bajo nuestro cuidado un tucán pico iris y cuatro micos de noche.

No obstante, sabemos que aún nos falta mucho más por lograr: el equipamiento de la clínica, por ejemplo. Entre nuestros planes para un futuro cercano está el desarrollo de protocolos para universidades e investigadores de todo el mundo que estén interesados en formar parte de nuestro equipo médico para avanzar

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en los proyectos de investigación y educación continua, y sobre todo la oportunidad y la asesoría para compartir públicamente nuestros avances para hacer de nuestra Misión y Visión sueño cumplido!

Invitamos a todas las personas que deseen saber más sobre nuestro proyecto o que quieran compartir sus experiencias en el mantenimiento de perezosos, a corresponder con nosotros: **Judy Avey-Arroyo**, Co-fundadora y Directora del Proyecto, y **Francisco Arroyo Murillo**, Veterinario Regente, Aviarios Sanctuary, 1 Km. Norte Puente Río Estrella, Peshurt, Limón, Costa Rica, o P. O. Box 569-7300, Limón, Costa Rica. Correo electrónico: <aviarios@costarica.net>.

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### ***The Biology of the Xenarthra***

Twenty-one years after the first true synthesis of edentate research, a book project is underway that promises to become the new standard reference for our field. *The Biology of the Xenarthra*, edited by Sergio Vizcaíno and Jim Loughry, is now under consideration by the University Press of Florida, with an estimated release in late 2007. Its appearance will be most welcome, and long overdue: the volume edited by Gene Montgomery appeared in 1985, and was itself based on the proceedings of a symposium held in 1979. Projected to be over seven hundred pages in length, the forthcoming volume is intended to be a panoramic survey of current research, drawing on the expertise of the majority of the active xenarthran community. This book (tome, even) promises to be the most comprehensive volume yet assembled on edentate research, and we expect it will prove invaluable to a new generation of students and researchers alike.

Here we present a tentative table of contents to indicate its scope, which includes contributions from the field, the museum and the laboratory in equal measure. For more information, please contact either of the editors: **Sergio Vizcaíno**, Departamento Científico Paleontología Vertebrados, Museo de La Plata, Paseo del Bosque s/n, 1900 La Plata, Argentina, e-mail <vizcaino@museo.fcnym.unlp.edu.ar>, and **Jim Loughry**, Department of Biology, Valdosta State University, Valdosta, Georgia 31698-0015, USA, e-mail <jloughry@valdosta.edu>.

*Tentative contents:* 1. Xenarthran biology: Past, present, and future – S. F. Vizcaíno and W. J. Loughry. Part 1: Phylogeny. 2. Recent advances and future prospects in xenarthran molecular phylogenetics

– F. Delsuc and E. J. P. Douzery; 3. Morphology-based investigations of the phylogenetic relationships among extant and fossil xenarthrans – T. J. Gaudin and H. G. McDonald. Part 2: Fossil Xenarthra. 4. Fossil history of sloths – H. G. McDonald and G. De Iuliis; 5. Paleogeographic distribution and anatomical adaptations in Peruvian megatheriine ground sloths (Xenarthra: Megatherioidea) – F. Pujos; 6. Evolution of the Vermilingua: An overview – H. G. McDonald, S. F. Vizcaíno and M. S. Bargo; 7. The evolution of armored xenarthrans and a phylogeny of the glyptodonts – J. C. Fernicola, S. F. Vizcaíno and R. A. Fariña; 8. Form, function and paleobiology in xenarthrans – S. F. Vizcaíno, M. S. Bargo and R. A. Fariña. Part 3: Living Xenarthra: Physiology and Genetics. 9. Armadillos and dimorphic pathogenic fungi: Ecological and evolutionary aspects – E. Bagagli and S. de M. G. Bosco; 10. Leprosy – R. W. Truman; 11. The spleen of the armadillo: Lessons of organ adaptation – E. B. Casanave and E. J. Galíndez; 12. The use of armadillo clones from the genus *Dasybus* as experimental models to investigate the source of physiological variability – P. Boily; 13. The physiology of two- and three-toed sloths – D. Gilmore, D. F. Duarte and C. Peres da Costa; 14. Sperm evolution in dasypodids – P. D. Cetica and M. S. Merani; 15. Reproductive biology of the nine-banded armadillo – R. D. Peeper; 16. Reproductive parameters and placentation in anteaters and sloths – K. Benirschke; 17. Placentation in armadillos, with emphasis on development of the placenta in polyembryonic species – A. C. Enders; 18. Sequencing the armadillo genome – J. Chang and J. Adams; 19. Chromosomal studies in the Xenarthra – W. Jorge and H. R. J. Pereira Jr.; 20. Genes and demes: Population genetic analyses of the Xenarthra – P. A. Prodöhl, W. J. Loughry and C. M. McDonough. Part 4: Living Xenarthra: Conservation. 21. Conservation status of the Xenarthra – J. M. Aguiar and G. A. B. da Fonseca; 22. Maintenance of Xenarthra in captivity – M. Superina, F. Miranda and T. Plese; 23. Exploitation of xenarthrans by the Guaraní-Isoseño indigenous people of the Bolivian Chaco: Comparisons with hunting by other indigenous groups in Latin America, and implications for conservation – A. J. Noss, R. L. Cuéllar and E. Cuéllar. Part 5: Living Xenarthra: Ecology and Behavior. 24. Anteater behavior and ecology – F. H. G. Rodrigues, Í. M. Medri, G. H. B. de Miranda, C. Camilo-Alves and G. Mourão; 25. Sloth ecology: An overview of field studies – A. G. Chiarello; 26. Behavioral ecology of armadillos – C. M. McDonough and W. J. Loughry; 27. Xenarthrans of the Paraguayan Chaco – D. A. Meritt Jr.; 28. Ecology and conservation of three species of armadillos in the Pampas region, Argentina – A. M. Abba and M. H. Cassini; 29. Biology and ecology of armadillos in

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the Bolivian Chaco – E. Cuéllar; 30. The natural history of the pichi, *Zaedyus pichiy*, in western Argentina – M. Superina.

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### ***Cyclopes didactylus* in Captivity**

Three silky anteaters are now being successfully hand-raised and maintained in captivity. Two animals are currently being cared for in a zoo in the outskirts of Lima, Peru. The Huachipa Zoo was able to rescue an orphaned male, now named Maximus, while he was so young that he still had his umbilicus attached. Maximus was successfully weaned onto a formula developed by the zoo's nutritionist and clinical staff (see Ledesma *et al.*, this issue). At 14 months, he is the longest-lived captive silky anteater on record. In addition, a female was recently flown from the Peruvian Amazon to the Huachipa Zoo for rehabilitation. She was started on the formula two weeks ago and has adjusted well so far. A third animal has been kept at the Aviarios Sanctuary in Costa Rica (see Avey-Arroyo and Murillo, this issue). Email contact between the Peruvian and Costa Rican researchers has greatly facilitated the effort of rehabilitating the Central American individual. A fourth animal was rescued two months ago by a rehabilitation group in Medellín, Colombia, but it died shortly thereafter. The fact that information is flowing freely and helping these rare and delicate specimens is a testament to the impact and future of global communications, as well as effective networking between interested professionals.

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### **Prospective Research Assistant for Sloth and Anteater Studies**

Laura Cisneros has recently graduated from Michigan State University with a BS in Zoology and an interest in graduate studies, with an emphasis on ecology, evolution and animal behavior. Between now and graduate school, she would like to gain research experience with Neotropical mammals; she has a particular interest in fieldwork with sloths or anteaters, and she would like to hear about projects focusing on any of these species.

Laura is currently in the field at the Cocha Cashu research station in Peru, assisting with a project on the ecology and behavior of spider monkeys. She will be available for future projects between September

2006 and June 2007. If you are looking for a field assistant, or have a colleague with a position available, Laura would be glad to hear of it at <cisnero7@msu.edu>. Her CV will be available on the website for the Edentate Specialist Group at <<http://www.edentata.org>>.

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### **Preliminary Organization of the First Conference on Xenarthran Conservation**

An informal group of xenarthran specialists and supporters is working to organize the First International Conference on the Conservation of Xenarthra, to be held in 2007 somewhere in Latin America. The proposal has awakened the interest of many field biologists, conservationists, zoo biologists, and veterinarians. Several sites have been considered with regard to their cost and accessibility, as well as the necessary infrastructure for a large conference. To date, Colombia, Argentina, Brazil and Peru have all shown interest in hosting the meeting, but the potential cost for Latin American participants has made Lima, Peru the most likely venue.

We welcome all input, especially proposals of program themes for discussion. Please send your comments and ideas to Mariella Superina at <mariella@superina.ch>.

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### **New PAX TAG Chair Elected**

John Gramieri, Mammal Curator at the San Antonio Zoo, has recently been elected chairman of the Pangolin, Aardvark and Xenarthran Taxon Advisory Group (PAX TAG) of the American Zoo and Aquarium Association (AZA). This TAG covers a number of important taxa, each facing unique challenges and deserving of genuine progress. There is a great deal of work as well as many exciting opportunities that will face the members of a new Steering Committee, who will be elected from the Institutional Representatives of interested AZA zoos. AZA's Taxon Advisory Groups serve as committees of expert advisors and provide a forum for discussing husbandry, veterinary, ethical and other issues that apply to entire taxa. In particular, they examine animal management techniques based on scientific studies, help to develop animal care and husbandry guidelines, and establish priorities for management, research and conservation.

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## Conservation Project for the Giant Anteater (*Myrmecophaga tridactyla*)—Zoológico de Florencio Varela, Argentina and ARTIS Zoo, Amsterdam, The Netherlands

Staff at the Zoológico de Florencio Varela (Buenos Aires, Argentina) have begun a cooperative project with the ARTIS Zoo (Amsterdam, The Netherlands) on the conservation of the giant anteater (*Myrmecophaga tridactyla*). The project has received approval from local wildlife authorities as well as the Zoo Associations of Buenos Aires (AZBA), Argentina (AZARA) and Latin America (ALPZA). The project is recognized by the European Endangered Species Program (EEP) of the European Association of Zoos and Aquaria (EAZA). The project entails development of a captive breeding program (a first birth took place on May 13, 2005), rehabilitation of animals rescued from the wild, and the establishment of an educational center for the conservation of the giant anteater. Field research is part of the next phase. For further information please contact Dr. Guillermo Pérez Jimeno, scientific advisor, at <tamandua@arnet.com.ar>.

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## Proyecto de Conservación Oso Hormiguero Gigante (*Myrmecophaga tridactyla*)—Zoológico de Florencio Varela, Argentina y ARTIS Zoo, Ámsterdam, Países Bajos

En el Zoológico de Florencio Varela, Buenos Aires, Argentina se ha comenzado a desarrollar un proyecto de conservación del oso hormiguero gigante (*Myrmecophaga tridactyla*). El mismo se lleva a cabo entre el citado zoo y el ARTIS Zoo, Ámsterdam, Países Bajos. El proyecto ya cuenta con el reconocimiento de las autoridades de fauna locales, la Asociación de Zoológicos de Buenos Aires (AZBA), la Asociación de Zoológicos y Acuarios de la República Argentina (AZARA), la Asociación Latinoamericana de Parques Zoológicos y Acuarios (ALPZA) y el EEP (Programa Europeo de Especies en Peligro, según sus siglas en inglés). En el marco del proyecto se desarrolla un programa de reproducción en cautiverio, con su primer nacimiento el día 13 de mayo de 2005 y un centro de educación para la conservación del oso hormiguero gigante. En la segunda etapa se desarrollarán investigaciones a campo. Si desea comunicarse con el proyecto puede dirigirse a MV Guillermo Pérez Jimeno, asesor científico, <tamandua@arnet.com.ar>.

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## RECENT PUBLICATIONS

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### Books

*Ecologia e História Natural da Mata Atlântica*, por Athayde Tonhasca Jr. 2005. Editora Interciência, Rio de Janeiro, Brasil. 198pp. ISBN 8571931305. R\$50,00. Após séculos de desmatamento, restam hoje menos de 10% do conjunto de ecossistemas que constitui a Mata Atlântica. A acentuada redução de área, aliada a sua imensa riqueza biológica e altos níveis de endemismo, fazem da Mata Atlântica uma das prioridades mundiais para preservação. Mais ainda, estes ecossistemas têm valor inestimável na prestação de serviços ecológicos tais como armazenamento de água, controle da erosão e ciclagem de minerais. Por estas razões, a Mata Atlântica representa rico patrimônio cultural, estético, biológico e econômico dos brasileiros. No entanto, apesar de oficialmente protegida pela Constituição, a Mata Atlântica continua a ser devastada, vítima da especulação imobiliária, extração ilegal de madeira, captura de animais, poluição e atividades agropecuárias. Esta obra faz um apanhado das informações científicas sobre a fauna, flora, ecologia, conservação e regeneração das florestas neotropicais e da Mata Atlântica, reunindo estudos de caso e farta bibliografia. Estas informações irão auxiliar professores e estudantes de cursos em Ciências Biológicas e Ambientais, assim como pessoas interessadas em ecologia e conservação, a conhecer alguns componentes destes ecossistemas e suas intrincadas relações ecológicas. *Para comprar:* visite <<http://www.editorainterciencia.com.br>> ou ligue para (21) 2581–9378 / 2241–6916.

*Mammal Species of the World*, Third Edition, edited by D. E. Wilson and D. M. Reeder. 2005. The Johns Hopkins University Press, Baltimore. 2000 pp. ISBN 0801882214 (hardback, two volumes), US\$125.00. Wilson and Reeder's *Mammal Species of the World* is the classic reference book on the taxonomic classification and distribution of the more than 5,400 species of mammals that are known to exist today. The third edition includes detailed information on nomenclature and, for the first time, common names. Each entry covers type locality, distribution, synonyms, and major reference sources. The systematic arrangement of information indicates evolutionary relationships at both the ordinal and the family level. This indispensable reference work belongs in public and



academic libraries throughout the world, and will be a valuable resource for every biologist who works with mammals. *Available from:* The Johns Hopkins University Press, 2715 North Charles Street, Baltimore, Maryland 21218-4363, Phone: (410) 516-6900, Fax: (410) 516-6968. Orders: 1-800-537-5487, Fax: (410) 516-6998. More information online at <<http://www.press.jhu.edu>>.

*Manual de Huellas de Algunos Mamíferos Terrestres de Colombia*, por José Fernando Navarro y Javier Muñoz. 2000. Edición de Campo, Medellín. 136 pp. Este libro está hecho para brindar información básica sobre mamíferos neotropicales. Describe e ilustra 33 especies de mamíferos de las que se pueden encontrar con mayor probabilidad sus rastros en el campo. Para cada una de ellas se incluyen ilustraciones de sus huellas con medidas aproximadas y dimensión de la pisada, una descripción de la especie, su taxonomía y nombres vernáculos con los cuales se la conoce en Colombia, datos ecológicos y de distribución, entre otros. Este libro está hecho para ser llevado al campo; puede ser utilizado por profesionales, naturalistas aficionados, estudiantes y el público en general. Con esta publicación se pretende generar el interés por el conocimiento y la conservación de nuestros mamíferos amenazados. Mas información: <<http://www.humboldt.org.co>>.

*Noninvasive Study of Mammalian Populations*, by W. E. Evans and A. V. Yablokov. 2004. Pensoft Publishers, Sofia, Bulgaria. 142 pp. ISBN 9546422045 (hardback), €37.80. Although it is a tenet of particle physics that nothing can be observed without its being altered by the observer, biologists have long sought to do precisely that. Apart from their theoretical interest, noninvasive techniques have particular value for the conservation of threatened and endangered species. Written by two specialists in marine mammal research, this book is an expanded English-language version of an earlier monograph published in Russian. As such it is written from a distinctly Russian perspective, in particular with its emphasis on phenetics—a Russian school of evolutionary thought based on the “phene,” which the authors define as “any discreet [sic] phenotypic character” which may be used to explore the frequencies of genotypes in a population. Although their expertise in cetacean biology inevitably inclines this book towards the ocean realm, much of what they detail may be applied to terrestrial mammals as well. *Available from:* Pensoft Publishers, Geo Milev Str., No 13a, 1113 Sofia, Bulgaria, Tel: +359-2-870-42-81, Fax: +359-2-870-42-82, e-mail: <[pensoft@mbox.infotel.bg](mailto:pensoft@mbox.infotel.bg)>. More information available at <<http://www.pensoft.net>>.

*Patterns of Behavior: Konrad Lorenz, Niko Tinbergen, and the Founding of Ethology*, by Richard W. Burkhardt Jr. 2005. The University of Chicago Press, Chicago. 648pp. ISBN 0226080900 (paperback, \$29.00). This book traces the scientific theories, practices, subjects, and settings integral to the construction of a discipline pivotal to our understanding of the diversity of life. Central to this tale are Konrad Lorenz and Niko Tinbergen, 1973 Nobel laureates whose research helped legitimize the field of ethology and bring international attention to the culture of behavioral research. Demonstrating how matters of practice, politics, and place all shaped “ethology’s ecologies,” Burkhardt’s book offers a sensitive reading of the complex interplay of the field’s celebrated pioneers and a richly textured reconstruction of ethology’s transformation from a quiet backwater of natural history to the forefront of the biological sciences. *Contents:* Acknowledgments; Introduction; Theory, Practice, and Place in the Study of Animal Behavior; 1. Charles Otis Whitman, Wallace Craig, and the Biological Study of Animal Behavior in America; 2. British Field Studies of Behavior: Selous, Howard, Kirkman, and Huxley; 3. Konrad Lorenz and the Conceptual Foundations of Ethology; 4. Niko Tinbergen and the Lorenzian Program; 5. Lorenz and National Socialism; 6. The Postwar Reconstruction of Ethology; 7. Ethology’s New Settings; 8. Attracting Attention; 9. Tinbergen’s Vision for Ethology; 10. Conclusion: Ethology’s Ecologies. *Available from:* The University of Chicago Press, 1427 E. 60th Street, Chicago, Illinois 60637, USA, Tel.: 773.702.7700, Fax: 773.702.9756, and online at <<http://www.press.uchicago.edu>>.

*Phylogeny and Conservation*, edited by Andy Purvis, John L. Gittleman and Thomas Brooks. 2005. Conservation Biology Series #8, Cambridge University Press, New York. 431pp. ISBN 0521532000 (paperback, \$60.00). Phylogeny is a potentially powerful tool for conserving biodiversity. This book explores how it can be used to tackle questions of great practical importance and urgency for conservation. Using case studies from many different taxa and regions of the world, the volume evaluates how useful phylogeny is in understanding the processes that have generated today’s diversity—and the processes that now threaten it. This book will be of great value to researchers, practitioners and policy-makers alike. *Contents:* 1. Phylogeny and conservation – A. Purvis, J. L. Gittleman and T. M. Brooks, p.1. Part 1: Units and currencies. 2. Molecular phylogenetics for conservation biology – E. A. Sinclair, M. Pérez-Losada and K. A. Crandall, p.19; 3. Species: Demarcation and diversity – P.-M. Agapow, p.57; 4. Phylogenetic units and currencies above and below the species level

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*The Rise of Placental Mammals: Origins and Relationships of the Major Extant Clades*, edited by Kenneth D. Rose and J. David Archibald. 2005. The Johns Hopkins University Press, Baltimore. 280 pp. ISBN 080188022X (hardback), US\$95.00. From shrews to blue whales, placental mammals are among the most diverse and successful vertebrates on Earth. Arising sometime near the Late Cretaceous, this broad clade

of mammals contains more than 1,000 genera and approximately 4,400 extant species. Although much studied, the origin and diversification of the placentals continue to be a source of debate. Here paleontologists Kenneth D. Rose and J. David Archibald have assembled some of the world's leading authorities to provide a comprehensive and up-to-date evolutionary history of placental mammals. Focusing on anatomical evidence, the contributors present an unbiased scientific account of the initial radiation and ordinal relationships of placental mammals, representing both the consensus and significant minority viewpoints. This book will be valuable to students and researchers in mammalogy, paleontology and evolutionary biology. Two chapters in particular focus on the edentates: "Xenarthra and Pholidota," by K. D. Rose, R. J. Emry, T. J. Gaudin and G. Storch, and "Molecular evidence for major placental clades," by M. S. Springer, W. J. Murphy, E. Eizirik and S. J. O'Brien. *Available from:* The Johns Hopkins University Press, 2715 North Charles Street, Baltimore, Maryland 21218-4363, Phone: (410) 516-6900, Fax: (410) 516-6968. Orders: 1-800-537-5487, Fax: (410) 516-6998. More information online at <<http://www.press.jhu.edu>>.

*What Makes Biology Unique? Considerations on the Autonomy of a Scientific Discipline*, by Ernst Mayr. 2004. Cambridge University Press, New York. 246 pp. ISBN 0521841143 (hardback), US\$30.00. This collection of new and revised essays argues that biology is an autonomous science rather than a branch of the physical sciences. Ernst Mayr, widely considered the most eminent evolutionary biologist of the 20th century, offers insights on the history of evolutionary thought, critiques the conditions of philosophy to the science of biology, and comments on several of the major developments in evolutionary theory. Notably, Mayr explains that Darwin's theory of evolution is actually five separate theories, each with its own history, trajectory and impact. Ernst Mayr, commonly referred to as the "Darwin of the 20th century" and listed as one of the top 100 scientists of all-time, was at the time of publication Professor Emeritus at Harvard University. *What Makes Biology Unique?* is the 25th book he wrote during his long and prolific career. *Contents:* Preface: What is there at issue?; Introduction; 1. Science and sciences; 2. The autonomy of biology; 3. Teleology; 4. Analysis or reductionism; 5. Darwin's influence on modern thought; 6. Darwin's five theories of evolution; 7. Maturation of Darwinism; 8. Selection; 9. Kuhn's scientific revolutions; 10. Another look at the species problem; 11. The origin of man; 12. Are we alone in this vast universe?; Glossary. *Available from:* Cambridge University Press, 40

West 20th Street, New York, NY 10011-4211, USA, Fax: 1-212-691-3239. General Address (Orders & Customer Service): Cambridge University Press, 100 Brook Hill Drive, West Nyack, NY 10994-2133, USA, Tel: 1-845-353-7500, Fax: 1-845-353-4141. Website: <http://www.cup.org>.

## Articles

- Abba, A. M., Sauthier, D. E. U. and Vizcaíno, S. F. 2005. Distribution and use of burrows and tunnels of *Chaetophractus villosus* (Mammalia, Xenarthra) in the eastern Argentinean pampas. *Acta Theriologica* 50(1): 115–124.
- Aldana-Marcos, H. J. and Affanni, J. M. 2005. Anatomy, histology, histochemistry and fine structure of the Harderian gland in the South American armadillo *Chaetophractus villosus* (Xenarthra, Mammalia). *Anatomy and Embryology* 209(5): 409–424.
- Bannikova, A. A. 2004. Molecular markers and modern phylogenetics of mammals. *Zhurnal Obshchei Biologii* 65(4): 278–305.
- Bargo, M. S., De Iuliis, G. and Vizcaíno, S. F. 2006. Hypsodonty in Pleistocene ground sloths. *Acta Palaeontologica Polonica* 51(1): 53–61.
- Boily, P. and Knight, F. M. 2004. Cold-induced fever and peak metabolic rate in the nine-banded armadillo (*Dasyus novemcinctus*). *Physiological and Biochemical Zoology* 77(4): 651–657.
- Bonaudo, T., Le Pendu, Y., Faure, J. F. and Quanz, D. 2005. The effects of deforestation on wildlife along the Transamazon highway. *European J. Wildlife Res.* 51(3): 199–206.
- Braga, F. G. 2004. Tamanduá-bandeira (*Myrmecophaga tridactyla*), espécie criticamente em perigo: Uma preocupação no Estado do Paraná. *Acta Biologica Paranaense* 33(1–4): 193–194.
- Brandoni, D., Carlini, A. A., Pujos, F. and Scillato-Yane, G. J. 2004. The pes of *Pyramiodontherium bergi* (Moreno & Mercerat, 1891) (Mammalia, Xenarthra, Phyllophaga): The most complete pes of a Tertiary Megatheriinae. *Geodiversitas* 26(4): 643–659.
- Brandstaetter, F. and Schappert, I. 2005. Breeding the giant anteater—a success story for Dortmund Zoo. *Intl. Zoo News* 52(2): 90–94.
- Brown, M. T. 2006. Birth and development of a La Plata three-banded armadillo (*Tolypeutes matacus*). *Animal Keepers' Forum* 33(2): 73–78.
- Calvopina, M., Armijos, R. X. and Hashiguchi, Y. 2004. Epidemiology of leishmaniasis in Ecuador: Current status of knowledge—a review. *Memorias do Instituto Oswaldo Cruz* 99(7): 663–672.
- Carranza Castañeda, O. and Miller, W. E. 2004. Late Tertiary terrestrial mammals from Central Mexico and their relationship to South American immigrants. *Rev. Brasil. Paleontologia* 7(2): 249–261.
- Casanave, E. B., Bermudez, P. M. and Polini, N. N. 2005. Haemostatic mechanisms of the armadillo *Chaetophractus villosus* (Xenarthra, Dasypodidae). *Comparative Clinical Pathology* 13(4): 171–175.
- Cetica, P. D., Marcos, H. J. A. and Merani, M. S. 2005. Morphology of female genital tracts in Dasypodidae (Xenarthra, Mammalia): A comparative survey. *Zoomorphology* (Berlin) 124(2): 57–65.
- Churakov, G., Smit, A. F. A., Brosius, J. and Schmitz, J. 2005. A novel abundant family of retroposed elements (DAS-SINEs) in the nine-banded armadillo (*Dasyus novemcinctus*). *Molec. Biol. Evolution* 22(4): 886–893.
- Clauss, M. 2004. The potential interplay of posture, digestive anatomy, density of ingesta and gravity in mammalian herbivores: Why sloths do not rest upside down. *Mammal Review* 34(3): 241–245.
- Corredor, G. G., Peralta, L. A., Castaño, J. H., Zuluaga, J. S., Henao, B., Arango, M., Tabares, A. M., Matute, D. R., McEwen, J. G. and Restrepo, A. 2005. The naked-tailed armadillo *Cabassous centralis* (Miller 1899): A new host to *Paracoccidioides brasiliensis*. Molecular identification of the isolate. *Medical Mycology* 43(3): 275–280.
- Deliberador-Miranda, J. M. and Airosa-Kosloski, M. 2003. Adaptações morfológicas do membro anterior ligadas ao habito escavador de *Dasyus novemcinctus* Linnaeus, 1758 e *Tamandua tetradactyla* Linnaeus, 1758 (Mammalia: Edentata). *Estudos de Biologia* (Curitiba) 25(52): 17–21.
- Delsuc, F., Vizcaíno, S. F. and Douzery, E. J. P. 2004. Influence of Tertiary paleoenvironmental changes on the diversification of South American mammals: A relaxed molecular clock study within xenarthrans. *BMC Evolutionary Biology* 4(11): 1–13.
- Dobigny, G., Yang, F., O'Brien, P. C. M., Volobouev, V., Kovacs, A., Pieczarka, J. C., Ferguson-Smith, M. A. and Robinson, T. J. 2005. Low rate of genomic repatterning in Xenarthra inferred from chromosome painting data. *Chromosome Res.* 13(7): 651–663.
- Duarte, D. P. F., Jaguaribe, A. M., Pedrosa, M. A. C., Clementino, A. C. C. R., Barbosa, A. A., Silva, A. F. V., Gilmore, D. P. and Costa, C. P. da. 2004. Cardiovascular responses to locomotor activity

- and feeding in unrestrained three-toed sloths, *Bradypus variegatus*. *Brazilian J. Med. Biol. Res.* 37(10): 1557–1561.
- Ealy, M. J., Fleet, R. R. and Rudolph, D. C. 2004. Diel activity patterns of the Louisiana pine snake (*Pituophis ruthveni*) in eastern Texas. *Texas J. Science* 56(4): 383–394.
- Engeman, R. M., Martin, R. E., Smith, H. T., Woolard, J., Crady, C. K., Shwiff, S. A., Constantin, B., Stahl, M. and Griner, J. 2005. Dramatic reduction in predation on marine turtle nests through improved predator monitoring and management. *Oryx* 39(3): 318–326.
- Estecondo, S., Codón, S. M. and Casanave, E. B. 2005. Histological study of the salivary glands in *Zaedyus pichiy* (Mammalia, Xenarthra, Dasypodidae). *Int. J. Morphology* 23(1): 19–24.
- Fernandes, G. F., Deps, P., Tomimori-Yamashita, J. and Camargo, Z. P. 2004. IgM and IgG antibody response to *Paracoccidiodioides brasiliensis* in naturally infected wild armadillos (*Dasypus novemcinctus*). *Medical Mycology* 42(4): 363–368.
- Garcia, J. E., Vilas-Boas, L. A., Lemos, M. V. F., Macedo Lemos, E. G. de and Contel, E. P. B. 2005. Identification of microsatellite DNA markers for the giant anteater *Myrmecophaga tridactyla*. *J. Heredity* 96(5): 600–602.
- Horovitz, I., Storch, G. and Martin, T. 2005. Ankle structure in Eocene pholidotan mammal *Eomanis krebsi* and its taxonomic implications. *Acta Palaeontologica Polonica* 50(3): 545–548.
- Kondrashov, F. A. 2005. The convergent evolution of the secondary structure of mitochondrial cysteine tRNA in the nine-banded armadillo *Dasypus novemcinctus*. *Biofizika* 50(3): 396–403.
- Lara-Ruiz, P. and Garcia-Chiarello, A. 2005. Life-history traits and sexual dimorphism of the Atlantic forest maned sloth *Bradypus torquatus* (Xenarthra: Bradypodidae). *J. Zool., Lond.* 267(1): 63–73.
- Lizarralde, M. S., Bolzán, A. D., Poljak, S., Pigozzi, M. I., Bustos, J. and Merani, M. S. 2005. Chromosomal localization of the telomeric (TTAGGG)<sub>n</sub> sequence in four species of armadillo (Dasypodidae) from Argentina: An approach to explaining karyotype evolution in the Xenarthra. *Chromosome Res.* 13(8): 777–784.
- Lopes-Ferreira, R. 2003. Depósitos sedimentares em cavernas: Registros de vida passada. *Bios (Belo Horizonte)* 11(11): 39–52.
- Medri, Í. M. and Mourão, G. 2005. Home range of giant anteaters (*Myrmecophaga tridactyla*) in the Pantanal wetland, Brazil. *J. Zool., Lond.* 266(4): 365–375.
- Monteiro, L. R. 2000. Geometric morphometrics and the development of complex structures: Ontogenetic changes in scapular shape of dasypodid armadillos. *Hystrix* 11(1): 91–98.
- Morgan, G. S. and Lucas, S. G. 2005. Pleistocene vertebrate faunas in New Mexico from alluvial, fluvial, and lacustrine deposits. *Bulletin of the New Mexico Museum of Natural History and Science* 28: 185–248.
- Nery, L. C. da R., Lorosa, E. S. and Franco, A. M. R. 2004. Feeding preference of the sand flies *Lutzomyia umbratilis* and *L. spathotrichia* (Diptera: Psychodidae, Phlebotominae) in an urban forest patch in the city of Manaus, Amazonas, Brazil. *Memorias do Instituto Oswaldo Cruz* 99(6): 571–574.
- Nogueira, D. R., Pereira, V. S. and Santana, A. P. 2005. The artificial termite mound: An alternative feeder for anteaters. *Intl. Zoo News* 52(2): 95–97.
- Novack, A. J., Main, M. B., Sunquist, M. E. and Labisky, R. F. 2005. Foraging ecology of jaguar (*Panthera onca*) and puma (*Puma concolor*) in hunted and non-hunted sites within the Maya Biosphere Reserve, Guatemala. *J. Zool., Lond.* 267(2): 167–178.
- Oliveira-Porpino, K. de, Cavalcante Ferreira dos Santos, M. de F. and Paglarelli-Bergqvist, L. 2004. Registros de mamíferos fósseis no Lajedo de Soledade, Apodi, Rio Grande do Norte, Brasil. *Rev. Brasil. Paleontologia* 7(3): 349–358.
- Orr, C. M. 2005. Knuckle-walking anteater: A convergence test of adaptation for purported knuckle-walking features of African Hominidae. *Am. J. Phys. Anthropol.* 128(3): 639–658.
- Pautasso, A. A. 2003. Aprovechamiento de la fauna silvestre por pobladores rurales en la fracción norte de los bajos submeridionales de la Provincia de Santa Fe, Argentina (incluye aspectos relacionados a la producción y la conservación en este ambiente). *Comunicaciones del Museo Provincial de Ciencias Naturales Florentino Ameghino* 8(2): 1–62.
- Perea, D. 2005. *Pseudohoplophorus absolutus* n. sp. (Xenarthra, Glyptodontidae), variabilidad en Sclerocalyptinae y redefinición de una biozona del Mioceno Superior de Uruguay. *Ameghiniana* 42(1): 175–190.
- Pereira, H. R. J., Jorge, W. and Costa, M. E. L. T. da. 2004. Chromosome study of anteaters (Myrmecophagidae, Xenarthra)—a preliminary report. *Genetics and Molecular Biology* 27(3): 391–394.
- Pinowski, J. 2005. Roadkills of vertebrates in Venezuela. *Rev. Brasil. Zool.* 22(1): 191–196.
- Prada, M. and Marinho-Filho, J. 2004. Effects of fire on the abundance of xenarthrans in Mato Grosso, Brazil. *Austral Ecology* 29(5): 568–573.

- Redi, C. A., Zacharias, H., Merani, S., Oliveira-Miranda, M., Aguilera, M., Zuccotti, M., Garagna, S. and Capanna, E. 2005. Genome sizes in Afrotheria, Xenarthra, Euarchontoglires, and Laurasiatheria. *J. Heredity* 96(5): 485–493.
- Rose, K. D., Emry, R. J., Gaudin, T. J. and Storch, G. 2005. Xenarthra and Pholidota. In: *The Rise of Placental Mammals: Origins and Relationships of the Major Extant Clades*, K. D. Rose and J. D. Archibald (eds.), pp. 106–126. The Johns Hopkins University Press, Baltimore.
- Salas, R., Pujos, F. and de Muizon, C. 2005. Ossified meniscus and cyano-fabella in some fossil sloths: A morpho-functional interpretation. *Geobios (Villeurbanne)* 38(3): 389–394.
- Schappert, I. 2005. *International Studbook for the Giant Anteater Myrmecophaga tridactyla (Linné, 1758)*. Eighth edition, 2001–2003. Zoo Dortmund, Dortmund.
- Sforzi, A. and Bartolozzi, L. 2004. Brentidae Billberg, 1820 (Brentinae, Cyphagoginae, Pholidochlamyidae, Taphroderinae, Trachelizinae, Ulocerinae) (Coleoptera, Curculionoidea). *Museo Regionale di Scienze Naturali Monografie* (Turin) 39: 19–828.
- Silva, E. A., Rosa, P. S., Arruda, M. S. P. and Rubio, E. M. 2005. Determination of duffy phenotype of red blood cells in *Dasybus novemcinctus* and *Cabassous* sp. *Brazilian J. Biol.* 65(3): 555–557.
- Simkin, S. M. and Michener, W. K. 2005. Faunal soil disturbance regime of a longleaf pine ecosystem. *Southeastern Naturalist* 4(1): 133–152.
- Springer, M. S., Murphy, W. J., Eizirik, E. and O'Brien, S. J. 2005. Molecular evidence for major placental clades. In: *The Rise of Placental Mammals: Origins and Relationships of the Major Extant Clades*, K. D. Rose and J. D. Archibald (eds.), pp. 37–49. The Johns Hopkins University Press, Baltimore.
- Staller, E. L., Palmer, W. E., Carroll, J. P., Thornton, R. R. and Sisson, D. C. 2005. Identifying predators at northern bobwhite nests. *J. Wildlife Mgmt.* 69(1): 124–132.
- Steadman, D. W., Martin, P. S., MacPhee, R. D. E., Jull, A. J. T., McDonald, H. G., Woods, C. A., Iturralde-Vinent, M. and Hodgins, G. W. L. 2005. Asynchronous extinction of late Quaternary sloths on continents and islands. *Proc. National Acad. Sci. USA* 102(33): 11763–11768.
- Tauber, A. A. 2005. Mamíferos fósiles y edad de la Formación Salicas (Mioceno tardío) de la sierra de Velasco, La Rioja, Argentina. *Ameghiniana* 42(2): 443–460.
- Thompson, A. K. 2004. Method for achieving a successful birth and weaning of a southern tamandua (*Tamandua tetradactyla*) at the Cincinnati Zoo and Botanical Garden. *Proceedings of the National Conference of the American Association of Zoo Keepers, Inc.* 31: 107–114.
- Wible, J. R. and Gaudin, T. J. 2004. On the cranial osteology of the yellow armadillo *Euphractus sexcinctus* (Dasypodidae, Xenarthra, Placentalia). *Ann. Carnegie Museum* 73(3): 117–196.
- Vizcaíno, S. F., Farina, R. A., Bargo, M. S. and De Iuliis, G. 2004. Functional and phylogenetic assessment of the masticatory adaptations in Cingulata (Mammalia, Xenarthra). *Ameghiniana* 41(4): 651–664.
- Voglino, D. and Pardinas, U. F. J. 2005. Roedores sigmodontinos (Mammalia: Rodentia: Cricetidae) y otros micromamíferos pleistocénicos del norte de la provincia de Buenos Aires (Argentina): Reconstrucción paleoambiental para el Ensenadense cuspidal. *Ameghiniana* 42(1): 143–158.
- van den Wildenberg, A., Nijboer, J. and Beynen, A. C. 2004. Feeding of the nine-banded armadillo (*Dasybus novemcinctus*) in captivity. *Zoologische Garten* 74(6): 358–364.
- Wilson, M. C., McDonald, H. G. and Hill, C. L. 2005. Fossil ground sloths, *Megalonyx* and *Paramylodon* (Mammalia: Xenarthra), from the Doeden local fauna, Montana. *Current Research in the Pleistocene* 22: 83–85.
- Zurita, A., Scillato-Yane, G. J. and Carlini, A. A. 2005. Paleozoogeographic, biostratigraphic, and systematic aspects of the genus *Sclerocalyptus* Ameghino, 1891 (Xenarthra, Glyptodontidae) of Argentina. *J. South American Earth Sci.* 20(1–2): 121–129.

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## MEETINGS

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### 2006

**Ecology in an Era of Globalization: Challenges and Opportunities for Environmental Scientists in the Americas**, 8–12 January 2006, Merida, Mexico. This conference will be held at the Fiesta Americana Hotel in Merida and is co-hosted by the Universidad Autónoma de Yucatán and the Centro de Investigaciones Científicas de Yucatán. Abstracts should address one of the meeting's three subthemes: invasive species, human migration, and production. The

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invasive species subtheme includes such topics as dispersal of invasive plant and animal species, emerging diseases, and resistance of local ecosystems to invasive species and disease. The human migration subtheme includes the environmental effects of international and local emigration and immigration on recipient and source areas. Potential topics include infrastructure development needs and impacts, effects on land cover, and land-use impacts. The production subtheme focuses on ecosystem transformations, including land-use change required to produce goods and services for human use. Potential topics include the effects of changes in forest and agricultural policy on economies, biodiversity, and ecosystems throughout the Americas, in terrestrial, marine, and freshwater systems. We particularly welcome reports of projects that are interdisciplinary and that consider the need to communicate with broad audiences. For more information or to submit an abstract, visit <<http://www.esa.org/mexico>>. Deadline for abstract submissions: 16 September 2005.

**First General Information Symposium for Two- and Three-Toed Sloths**, 19–22 July 2006, Aviarios Sanctuary, Limón, Costa Rica. The first symposium on the practical aspects of sloth biology and rehabilitation in Mesoamerica, this meeting will introduce participants to the Aviarios Sanctuary and the lessons they have learned during their many years of operation. The symposium program includes presentations on the biology, captive maintenance and medical management of sloths, with an emphasis on caring for sloths in the sanctuary setting. The symposium package includes round-trip bus transportation from San José, meals and lodging in the nearby town of Cahuita, and a day trip to Cahuita National Park, as well as a tour of the Aviarios facilities and an outing on the Río Estrella. Deadline for registration is 1 June 2006. For more information contact Judy Avey, Project Director, Aviarios Sanctuary, 1 Km. Norte Puente Río Estrella, Penshurt, Limón, Costa Rica, or P. O. Box 569-7300, Limón, Costa Rica, e-mail: <[aviarios@costarica.net](mailto:aviarios@costarica.net)>.

**1<sup>st</sup> European Congress of Conservation Biology**, 22–26 August 2006, Eger, Hungary. The European Section of the Society for Conservation Biology is determined to promote the development and use of science for the conservation of European species and ecosystems, and to make sure that conservation policy is firmly underpinned by the best available scientific evidence. This keystone congress will bring together a wide array of academics, policymakers, students, NGO representatives, and biodiversity managers from throughout Europe and beyond. For more

information, see the Congress website at <<http://www.eccb2006.org>> or contact Andrés Báldi, Chair of the Local Organising Committee, at <[baldi@nhmus.hu](mailto:baldi@nhmus.hu)>.

**VII Congreso Internacional sobre Manejo de Fauna Silvestre en la Amazonía y América Latina**, del 3 al 7 de septiembre de 2006, Ilhéus, Bahia, Brasil. El VII Congreso Internacional sobre Manejo de Fauna Silvestre en la Amazonía y América Latina enfocará su atención en los estudios y programas de manejo que actualmente están siendo ejecutados en la Amazonía y en Latinoamérica, con el propósito de evaluar los resultados alcanzados y las limitaciones encontradas en la conducción de los mismos. Una de sus principales metas será expandir el enfoque del evento a los más amplios aspectos del manejo de fauna en toda Latinoamérica. El VII Congreso Internacional sobre Manejo de Fauna Silvestre en la Amazonía y América Latina incluirá conferencias magistrales, mesas redondas, secciones temáticas con presentaciones orales libres, exposiciones en posters, simposios, workshops, cursos durante y posteriores al congreso, y excursiones pos-congreso. Las áreas temáticas que se abordarán en este evento serán: conservación *in situ* y áreas naturales protegidas, conservación *ex situ* de fauna silvestre, preservación y recuperación de hábitats, metodologías aplicadas para el manejo de fauna silvestre con comunidades, criterios para el uso sustentable de fauna silvestre, indicadores de sustentabilidad, etología aplicada al manejo, medicina veterinaria de la conservación, fisiología y ecología, producción en criaderos, comercio, política y legislación de fauna silvestre. Apreciaremos el apoyo de diversas instituciones. Existen posibilidades de instalación de stands institucionales para difusión y ventas. Para mayor información: <<http://www.viicongresso.com.br>>.

**I Congresso Sul-Americano de Mastozoologia**, 05 a 08 de outubro de 2006, Gramado, Rio Grande do Sul, Brasil. A Sociedade Brasileira de Mastozoologia (SBMz), a Sociedad Argentina para el Estudio de los Mamíferos (SAREM) e a Asociación Boliviana de Investigadores de Mamíferos (ABIMA) vêm convidar a todos os interessados a participarem do I Congresso Sul-Americano de Mastozoologia. Devido ao aumento do número de trabalhos sobre mamíferos observados nos últimos congressos brasileiros, argentinos e bolivianos de mastozoologia e, tendo como objetivo promover o desenvolvimento de pesquisas abrangendo problemáticas trans-nacionais, decidiu-se em comum acordo, organizar um congresso que reúna todos os profissionais e interessados pelo tema em um único e específico encontro. O I Congresso Sul-Americano de Mastozoologia tem como objetivos

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principais: 1) reunir a comunidade de mastozoólogos que atuam em genética, ecologia, sistemática, comportamento, morfologia, fisiologia, evolução, conservação, paleontologia e outros campos das ciências biológicas relacionados a mamíferos, propiciando a apresentação e discussão de trabalhos em andamento e fomentando a integração dos diferentes grupos; 2) incentivar a congregação de estudantes e profissionais envolvidos no estudo e na preservação de mamíferos sul-americanos; 3) promover o contato e a integração entre as sociedades nacionais, bem como junto a entidades governamentais e privadas; 4) divulgar o conhecimento sobre a fauna de mamíferos junto ao público em geral; e 5) zelar pelos padrões éticos e científicos da mastozoologia na América do Sul. As propostas de workshops, palestras e mini-cursos poderão ser enviadas desde já, até 15 de abril, para o seguinte e-mail: <csMZ2006@ufrgs.br>. O preço de inscrição assim como as modalidades e datas limites para submissão de resumos, para comunicações orais e para pôsters, estarão disponíveis no site <<http://www.ufrgs.br/csmz2006>>, a partir do dia 17 de abril de 2006. As inscrições serão aceitas exclusivamente por internet.

be addressed to <bkonstant@houstonzoo.org> and to <priger@houstonzoo.org>. Abstracts submitted as hard copy should be addressed to: 2007 ZACC Conference, Attn: Bill Konstant, Director of Conservation and Science, Houston Zoo, 1513 North MacGregor, Houston, Texas 77030, USA. For more information, see the conference website at <<http://www.houstonzoo.org/ZACC>>.

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## 2007

**6<sup>th</sup> Zoos & Aquariums Committing to Conservation Conference**, 26–31 January 2007, Houston, Texas. ZACC is a bi-annual event that promotes the role of zoos and aquariums in supporting conservation activities worldwide, both at their institutions and in the field. Conference participants include representatives from zoological institutions, international conservation organizations, local non-governmental organizations, government agencies, funding agencies and, most importantly, field biologists and conservationists. Presentations at the 2007 ZACC will highlight both ongoing projects and new initiatives that offer opportunities for institutional support. There will be a major focus on field-based initiatives that have already established links to zoos and aquariums, as well as promising candidates for such partnerships. In addition, the program will feature presentations related to the organization, management, and support of zoo-based and aquarium-based conservation programs. The full conference registration fee (\$195) will include icebreaker event, all sessions, breaks, lunches, conference proceedings, zoo day transport, zoo day lunch and dinner. All funds raised above conference costs will be allocated to the conservation fund for this conference. The deadline for submitting paper and poster abstracts is September 1, 2006. Abstracts submitted electronically should