

01 January 2006

Zoological Society of Buffalo Board of Directors
Research and Conservation Committee Members
Buffalo Zoo Staff Members

Dear Colleagues:

The Zoological Society of Buffalo, Inc. is pleased to present the 2005 Annual Report on Research and Conservation at the Buffalo Zoo. This report is indicative of the high priority that the Board of Directors and professional staff place on the institutional commitment to furthering our understanding of nature, and the Buffalo Zoo's role in conserving the bio-diversity of the world's plant and animal life through captive conservation efforts.

This report also demonstrates the possibilities that the Zoo's collection can hold for researchers. Further, it should serve as an invitation to all interested parties to submit proposals to the Research and Conservation Committee to conduct non-invasive research projects at the Zoo.

We are proud of the role that the Buffalo Zoo is playing in research and conservation. As an institution, and as the professional representatives of that institution, we remain committed to our program and encourage the collaborative efforts of staff, researchers and conservation organizations.

Sincerely,

Donna Fernandes, Ph.D.
President and CEO

Gerald D. Aquilina
General Curator

Frank Ridgley, DVM
Veterinarian

***BUFFALO ZOOLOGICAL GARDENS
RESEARCH AND CONSERVATION COMMITTEE
ANNUAL REPORT 2005***

***RESEARCH AT THE
BUFFALO ZOOLOGICAL GARDENS***

The Zoological Society of Buffalo Inc., within its Mission Statement emphasizes as priorities the “advancement and encouragement of the science of zoology; and the practice of conservation of wildlife in the world”. The Society, through the Research and Conservation Committee, promotes research at the Buffalo Zoo and extends an invitation to interested parties to initiate projects utilizing the Zoo’s animal collection.

THE RESEARCH AND CONSERVATION COMMITTEE

The Committee is structured to represent zoo, academic and community interests. The composition of the Committee is determined by the President/CEO of the Zoo and is renewed on an annual basis. The Zoo is deeply indebted to the following individuals for their expertise, service and commitment to conservation and research:

- Donna Fernandes, Ph.D. - President/CEO, Zoological Society of Buffalo
- Michael Noonan, Ph.D. - Canisius College
- Ed Standora, Ph.D. - SUNY College at Buffalo
- Carol Berman Ph.D. - SUNY at Buffalo
- Beth Marks - Zoological Society of Buffalo Board Liaison
- Sandy Mendel - SUNY at Buffalo, Board Liaison
- Lisa Brooks, Ph.D. - SUNY College at Buffalo
- Jeffrey Wyatt, DVM - Seneca Park Zoo, Rochester, NY
- Barbara Carr - Executive Director, Erie County SPCA
- Frank Ridgley, DVM - Veterinarian, Zoological Society of Buffalo
- Gerald D. Aquilina - General Curator, Zoological Society of Buffalo

In addition to their service on the Research and Conservation Committee, all of these individuals also serve on the Institutional Animal Care and Use Committee (IACUC). This committee inspects, reports and oversees all research and research sites at the Zoo in accordance with the regulations governing research as mandated by the United States Department of Agriculture.

Research Projects Supported in 2005

The Zoological Society of Buffalo recognizes that important contributions are made to the Zoo and to the profession by research efforts. The Society also recognizes that research benefits society at large by contributing to our collective knowledge of nature. Research projects conducted or contributed to as a result of Committee approval and/or cooperation with AZA requests in 2005, and those projects continued from previous years are listed below.

“Methods of Conflict Management in Sulawesi Macaques (*Macaca nigra*)”

Ramsey, Jacklyn, M.A. candidate SUNY at Buffalo. Observations of a group of Sulawesi macaques were made before, during, and after feeding to determine methods used by the species to mitigate aggression during a potentially stressful event.

“An Evaluation of Grip Morphology for a Foraging Task in Gorillas”

Lisa Brooks, Ph.D. SUNY College at Buffalo as collaborator for William D. Hopkins, Ph.D., Yerkes National Primate Research Center Division of Psychobiology. The goal of the project was to evaluate the different ways gorillas grip and manipulate food to provide empirical evidence in a comparison across different ape species.

“Gauging Bite Strength at Different Gapes of Lions and Tigers”

Frank Mendel, Ph.D. SUNY Buffalo Department of Anatomy. Fluid filled, gauged, puncture proof, non-toxic hoses of different diameters were presented to lions and tigers in order to gauge their bite strength. Data collected will be applied to extinct sabertoothed cats.

“Scent Discrimination in Lions and Tigers and Its Implication in Kin Recognition”

Kelly Caffery, SUNY College at Buffalo Department of Psychology. Urine was used to determine if the cats can discriminate the scent as it relates to kin.

“Electrocardiography in Elephants”

Susan Bartlett and Noha Abou-Madi, DVM, MS Cornell University.

This study is assessing the most effective and accurate techniques to perform electrocardiography on elephants. Normal ranges for P-QRS-T complexes and the effects of body weight, sex, age, and species will be established.

“Analysis of Gastric Phytobezoar Formation in Prehensile-tailed Porcupines, *Coendu prehensilis*”

Frank Ridgley, DVM, Buffalo Zoological Gardens

This study involves the investigation of a syndrome of gastric phytobezoar formation in captive *Coendou prehensilis*. The phytobezoars were analyzed by some independent laboratories for composition and from this we hope to devise a medical alternative to resolution rather than surgical. Initiated in 2004 and continued in 2005.

Distribution of Artifacts, Samples and Data in 2005

In the course of normal operation of the Zoo, certain animal artifacts and animal management data may become available for use by legitimate researchers. For the most part the artifacts consist of post mortem tissues but can also encompass serum samples, fecal samples or even x-ray films. Management data consists of diet, veterinary, inventory, and husbandry records. The Zoological Society encourages the constructive use of such artifacts and data derived from the collection. Obtaining animal related artifacts and data is subject to Committee approval. In 2005, artifacts and/or data were supplied or cooperation was committed/continued to the following researchers:

Atsalis, Sylvia, PhD., Margulies, Sue, PhD., Brookfield Zoo. Provided data in support of research project "Assessing Reproductive Senescence in Captive Female Western Lowland Gorillas".

Brown, Janine, Ph.D., Conservation and Research Center, Front Royal, VA., AZA Elephant SSP Reproductive Advisor. Blood samples from Asian elephants provided to monitor hormones to determine cyclicity.

Bunderson, J. Stuart, Associate Professor of Organizational Behavior, Washington University in St. Louis, Missouri. Participation in AAZK national study of animal care professionals.

Christensen, Bruce DVM, University of Florida Large Animal Clinical Sciences. Blood draws from the male Indian rhino for analysis of hormone concentrations. Seasonal, age, and sociosexual variation will be documented in the SSP population.

Diernfeld, Ellen, PhD., Canid TAG Nutrition Advisor, St. Louis Zoo. Hyena Diet Survey completed.

Dubach, Jean DVM, Brookfield Zoo, Chicago, Illinois. Blood samples provided for DNA analysis of ring-tailed lemurs to determine population relatedness for the SSP.

Erwin, Joseph, Ph.D., Division of Neurobiology and Behavior, Bioqual, Inc. Continued commitment to The Great Ape Aging Project by agreeing to provide brain tissues upon necropsy.

Fayer, Ronald, Ph.D. USDA, ARS Senior Scientist, Beltsville, MD. Identification of Giardia through PCR and gene sequencing from fecal specimens. Provided suspect fecal samples for identification.

Georoff, Tim, VMD, Intern Zoological Medicine, Oklahoma State University/Tulsa Zoo, Oklahoma. Medical records provided to support a retrospective study on the seroprevalance and associated clinicopathologic data of wallaby retrovirus in North American Zoos.

Hammond, Beth, DVM, Audubon Park Zoo. LA. Data provided regarding metronidazole toxicity in maned wolves.

McMillan, Amy, Ph.D., SUNY College at Buffalo. Fecal samples provided for DNA extraction and genotyping of mandrill and ring-tailed lemur.

Mott, Bill, Director: The Ocean Project. An ocean literacy survey designed to see what we think are the key concepts, messages, conservation issues, barriers, and communication tools of which every ocean literate person should be aware.

Noonan, Michael Ph.D., Canisius College Psychology Department: Anatomy of cerebral commissures in brains. Cerebral commissures are the bundles of neuronal fibers which interconnect the two sides of the brain and are responsible for coordination between the right and left side. Post mortem harvest of mammal and bird brains for anatomical comparison.

Parker, Patty, Ph.D., University of Missouri at St. Louis. Samples from fennec fox provided for DNA analysis to help develop pedigrees for the SSP population.

Riniolo, Carol, Niagara County Community College. Blood samples provided to aid in the instruction of Animal Management students in the area of cellular transport mechanisms.

Russello, Michael, Ph.D., Yale University Department of Ecology and Evolutionary Biology, New Haven, CT. in collaboration with The Wildlife Conservation Society, Captive Breeding Specialist Group, and Amur Tiger SSP. Fecal samples provided for DNA extraction to compare genetic variability in the captive population with that of the wild population.

Ryder, Oliver A, Ph.D., San Diego Zoo Center for the Reproduction of Endangered Species: Skin biopsy samples from specific individuals of SSP© mammals were provided opportunistically. The DNA of these animals will be preserved in the Frozen Zoo.

Ryder, Oliver, Ph.D. Zoological Society of San Diego Center for Reproduction of Endangered Species. Biopsy and blood samples from selected primates were provided and authorization given for inclusion in the Integrated Primate Biomaterials and Information Resource to allow progeny cells and derived DNA to be broadly available to qualified investigators.

Savarese, Joseph, DVM Medaille College Veterinary Technician Program. Blood and fecal samples provided to aid in the instruction of veterinary technology students in the areas of clinical pathology and parasitology.

Songasasen, Nucharin, DVM, Ph.D., National Zoological Park Conservation and Research Center, AZA Maned Wolf SSP. "*Stress and Reproduction in Maned Wolves (Chrysocyon brachyurus)*" Fecal samples and behavioral observations provided in order to monitor fecal corticoids in relation to reproductive success.

Terio, Karen, DVM, PhD, Diplomate ACVP, Pathologist, Clouded Leopard SSP, University of Illinois. Historic necropsy reports for clouded leopards provided.

Voin, Doina, Forensic Scientist QAQC Standards, USFWS National Forensics Laboratory, Ashland Oregon. Samples provided from various exotic animals for the Standards Collection to aid in the identification of materials involved in possible violations of wildlife and conservation laws and regulations.

Walsh, Daniet, LVT, MPS, Purdue University School of Veterinary Medicine, West Lafayette, Indiana. Stained blood and cytology films provided for the education of veterinary technology students at Purdue.

Zschokke, Samuel, Ph.D., University of Basel, International Rhino Foundation. The Buffalo Zoo continues to act as the U.S. Coordinator for the shipping of blood samples to the University of Basel to facilitate a study to analyze the genetic relationship between the two populations of Indian rhinos in Assam (India) and Nepal.

Financial support was provided to the following conservation organizations in 2005

AZA Conservation Endowment Fund- Regular donations are made to the Conservation fund through proceeds from on site “wishing wells” and through the Research/Conservation Fund. Informational graphics about the Conservation Endowment Fund are provided at the site of the donation.

Association of Zoological Horticulture (AZH) Conservation Fund- Yearly contributions through the Zoo Horticulturalist to the AZH auction. Proceeds fund grants from the AZH Conservation Fund for worldwide plant conservation

Grizzly & Wolf Discovery Center- Financial support of brown bear conservation and rescue and Yellowstone National Park education efforts.

International Elephant Foundation- Financial support for Saving Elephants by Helping People project in Sri Lanka involving the erection of a solar powered electric fence to resolve human-elephant conflict. Financial support was provided for the IEF Elephant Symposium.

International Species Information System (ISIS)- Provided financial support to the Maracaibo Zoo, Venezuela for year 2005 membership in ISIS.

International Snow Leopard Trust- Financial support of Natural Partnerships Program.

olar Bears International- Contributions to this non-profit organization dedicated to the worldwide protection of the polar bear.

BUFFALO ZOOLOGICAL GARDENS CONSERVATION INVOLVEMENT

Conservation through captive animal management is of paramount importance to global wildlife preservation. On an international basis, zoos are cooperating to insure the long term genetic and demographic preservation of targeted endangered and threatened species. In the United States under the auspices of the American Zoo and Aquarium Association, the Species Survival Plan © (SSP ©), Population Management Plan (PMP), Studbooks, Taxon Advisory Groups (TAG) and Conservation Action Partnerships (CAP) have been implemented.

The Species Survival Plan © is a cooperative effort to maintain a viable captive population of a species through close genetic and demographic management. In situ conservation and education programs are also a part of an SSP ©. Currently there are over 100 designated species, of which the Buffalo Zoo works with 25. The Buffalo Zoo also participates in 40 Population Management Plan (PMP) programs. These programs manage the captive population utilizing the studbook as the primary tool. (*Appendix 1*)

An important component in captive population management for any single species is the maintenance of a good database or record keeping system. Studbooks are the database that represents the history of a captive population: genealogies, captive locations, sex and birth information. The Buffalo Zoo provides information on an annual basis to 67 regional and international studbooks. (*Appendix 1*)

The viability and sustainability of wildlife populations is monitored on international, national and regional bases. Various designations of endangered, threatened, vulnerable or special concern status are applied and legal protection granted accordingly. *Appendix 1* lists those species in collection at the Buffalo Zoo that are regulated under either CITES, USDI or New York State. In large part, collection composition at Buffalo is influenced by these conservation concerns and the long-term need to maintain a viable and healthy gene pool in support of captive conservation efforts.

A Taxon Advisory Group (TAG) takes a systematic approach to the management of an entire Taxon through regional collection planning, SSP and studbook recommendations and overall issues of management and husbandry. The Buffalo Zoo actively participates in 41 TAG's. (*Appendix 2*)

Conservation Action Partnerships (CAP) serve to promote and coordinate cooperative scientific and conservation programs within a specific geographic region. The Buffalo Zoo participates in seven CAPs. (*Appendix 3*)

Appendix 1

	CITES	USDI	SSP/PMP	Studbook	NY
Mammals					
tamar/scrub wallaby			PMP	X	
wallaroo			PMP	X	
Straw-colored fruit bat (Education)			PMP	X	
ring-tail lemur	I	E	SSP	X	
douroucouli	II		PMP	X	
cotton-top tamarin	I	E	SSP	X	
golden lion tamarin	I	E	SSP	X	
Japanese macaque	II	T	SSP	X	
black ape	II		SSP	X	
mandrill	I	E	SSP	X	
w. lowland gorilla	I	E	SSP	X	
two-toed sloth			PMP	X	
maned wolf	II	E	SSP	X	
spectacled bear	I		SSP	X	
polar bear	II		SSP	X	
grizzly bear	II	T		X	
Kodiak bear	II	T		X	
red (lesser) panda	I		SSP	X	
binturong			PMP	X	
slender-tailed meerkat			PMP	X	
river otter	II		SSP	X	
spotted hyena			PMP	X	
Fennec fox (Education)	II		SSP	X	
serval	II		PMP	X	
African lion			SSP	X	
clouded leopard	I	E	SSP	X	
Siberian tiger	I	E	SSP	X	
snow leopard	I	E	SSP	X	
Indian elephant	I	E	SSP	X	
rock hyrax			PMP	X	
common zebra			PMP	X	
South American tapir (loan out)	II	E	PMP	X	
great Indian rhinoceros	I	E	SSP	X	
collared peccary			PMP	X	
guanaco	II				
reticulated giraffe			SSP	X	
gaur (loan out)	I	E	SSP	X	
addax	I		SSP	X	
roan antelope			PMP	X	

gemsbok			PMP	X	
bighorn sheep		E			

	CITES	USDI	SSP	Studbook	NY
Birds					
red-breasted goose	II				
black-necked swan	II		PMP	X	
Baikal teal	II				
cinereous vulture	II		SSP	X	
golden eagle	II				E
American kestrel (Educ)	II				
Harris hawk (Education)	II				
nanday conure (Education)	II				
blue and gold macaw (Educ)	II				
Senegal parrot (Education)	II				
red-rumped parrot	II				
princess parrot	II				
Cloncurry parrot	II				
eastern Rosella	II				
Bourke's parrot	II				
Edward's lorikeet	II				
green-naped lorikeet	II				
black lory	II				
blue-streaked lory	II				
rainbow lory	II				
red lory	II				
yellow dusky lory	II				
yellow-streaked lory	II				
Lady Ross' plantain eater				X	
eastern screech owl (Educ)	II				
great horned owl (Educ)	II				
snowy owl	II				
trumpeter hornbill			PMP	X	
lilac-breasted roller			PMP	X	
Pekin robin	II				
Reptiles					
three-striped box turtle	II		PMP	X	

Annam leaf turtle			PMP	X	
Reeve's turtle			PMP	X	
giant So Am river turtle	II				
S American red-footed tortoise	II				
pancake tortoise	II		PMP	X	
Hermann's tortoise	II				
desert tortoise	II	T			
gopher tortoise	II	T			
eastern box turtle (Educ)	II				
American alligator	II	T			
Mexican beaded lizard	II		PMP	X	
gila monster	II			X	
	CITES	USDI	SSP	Studbook	NY
Egyptian spiny-tail lizard	II				
belted chameleon	II				
Parson's chameleon	II				
Modest day gecko (modesta)	II				
yellow-throated day gecko	II				
prehensile-tailed skink	II		PMP	X	
black tree monitor	II		PMP	X	
Virgin Islands boa	I	E	SSP	X	
emerald tree boa	II		PMP	X	
sand boa	II				
reticulated python	II		PMP	X	
olive python	II				
ball python (Education)	II				
eastern indigo snake		T	PMP	X	
king cobra	II		PMP	X	
Arizona ridgenose rattlesnake			PMP	X	
Eastern diamondback rattlesnake			PMP	X	
Mexican lance-headed rattlesnake			PMP	X	
eyelash palm-pitviper			PMP	X	
eastern massasauga rattlesnake			PMP	X	E
Amphibians					

Japanese giant salamander	I	E			
Puerto Rican crested toad		T	SSP	X	
green/black poison dart frog	II				
blue poison dart frog	II		PMP		
yellow/blue poison dart frog	II				
bicolored poison dart frog	II				
golden poison dart frog	II				
Madagascar golden frog	II				
tomato frog	I				
Panamanian golden frog	I	E	PMP	X	
golden mantella	II		PMP		
TOTALS	88	25	25 SSPs 37 PMPs	63	2

Reviewed 20 Oct 2005

Appendix #2

Antelope and Giraffe TAG
Ape TAG
Bat TAG
Bear TAG
Bison, Buffalo, Cattle TAG
Canid/Hyena TAG
Caprid TAG
Deer TAG
Elephant TAG
Equid TAG
Felid TAG
Marine Mammal TAG
Marsupial/Monotreme TAG
New World Primate TAG
Old World Primate TAG
Prosimian TAG
Pig and Peccary TAG
Rhino TAG
Rodent TAG
Small Carnivore TAG
Tapir TAG

Anseriiforme TAG
Ciconiiforme TAG
Charradriiformes TAG
Coraciiforme TAG
Galliforme TAG
Parrot TAG
Passeriforme TAG
Piciforme TAG
Raptor TAG
Turaco TAG

Amphibian TAG
Chelonian TAG
Crocodilian TAG
Lizard TAG
Snake TAG

Freshwater fish TAG

Terrestrial Invertebrate TAG

Appendix 3

Brazilian CAP

East African CAP

Mesoamerican CAP

North American CAP

Paraguay CAP

South East Asian CAP

Venezuela CAP