

# **DRAFT FOR REVIEW**

01 July 2009

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 2008 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 M. Fernandes, Ph.D.  
President and CEO

Gerald D. Aquilina  
General Curator

Kurt Volle, DVM  
Staff Veterinarian

***BUFFALO ZOOLOGICAL GARDENS  
RESEARCH AND CONSERVATION COMMITTEE  
ANNUAL REPORT 2008***

***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
- Jeffrey Wyatt, DVM - Seneca Park Zoo, Rochester, NY
- Barbara Carr - Executive Director, Erie County SPCA
- Kurt Volle, DVM - Staff 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 function like an Institutional Animal Care and Use Committee (IACUC). The Research and Conservation Committee inspects reports and oversees all research and research sites at the Zoo.

## **Research Projects Supported in 2008**

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 2008, and those projects continued from previous years are listed below.

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

Frank Mendel, PhD. 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. Refinements of the puncture proof devices were accomplished in 2008. Data collected will be applied to extinct sabertoothed cats.

### **Pregnancy diagnosis through urine hormone analysis in giraffe.**

Janine Brown, Nichole Abbondanza, National Zoological Park Conservation and Research Center; Gerald Aquilina, Vicky Hodge Buffalo Zoological Gardens. The purpose of this pilot study is to determine if pregnancy in giraffe can be accurately diagnosed through urine hormone levels. Data collection continued in 2008 with the pregnancy and delivery of a female calf.

### **Olfactory enrichment for Ring-tailed lemurs at the Buffalo Zoo.**

Katie Struck SUNY at Buffalo. The study tests the effect of scents on the behavior of ring-tailed lemurs. The study continued into 2008 so a statistically significant number of samples could be obtained.

### **The Effects of Puzzle Feeders on Foraging Behavior in a Captive Group of Mandrills at the Buffalo Zoological Gardens.**

Sara Everson, SU NY at Buffalo. The effect of puzzle feeders on the percentage of time the mandrills spend foraging in their outdoor enclosure is tested.

## **Distribution of Artifacts, Samples and Data in 2008**

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 2008, artifacts and/or data were supplied or cooperation was committed/continued to the following researchers:

Agnew, Dalen W., DVM, PhD. Diagnostic Center for Population and Animal Health, Michigan State University. Samples provided for the study of bone mineral concentrations in exotics.

Baizer, Joan, Ph.D. Associate Professor of Physiology and Biophysics, SUNY at Buffalo. Brain and central nervous system samples from animals at necropsy for the study of comparative organization of mammalian brains and understanding of brain evolution.

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.

Chabot, Adrien, Ph.D., University of Chicago. Agreement to provide liver and kidney samples at necropsy from great apes to aid in a study to compare gene expression profiles in livers and kidneys between humans.

Connolly, Mike, Assistant Animal Curator, Tulsa Zoo and Living Museum. Survey regarding staffing levels at Marine Mammal facilities completed.

Dennis, Pamula DVM, Veterinary Epidemiologist Cleveland Metroparks Zoo. AZA Gorilla SSP Vet Advisor. Data for the AZA Gorilla Health Project was provided

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.

Hylander, Bill, PhD. Duke University. Access to immobilized primates provided to take body measurements for comparative anatomy study.

International Elephant Foundation, AZA Elephant SSP, AZA Conservation Endowment Fund. Study to reduce elephant deaths caused by Endotheliotropic Elephant Herpes Virus (EEHV). Historic data and blood samples provided to determine prevalence of EEHV in collection animals. Sample submission continued in 2008.

Kutinsky, Ilana, Ph.D. et. Al. AZA Gorilla Veterinary Advisory Team. Samples and test results provided for the evaluation of risk factors associated with cardiac disease in gorillas in AZA institutions.

Less, Elena, Graduate Research Associate, Cleveland Metroparks Zoo. Survey completed and data provided to research involving hair plucking behavior in lowland gorillas.

Munson, Linda, Ph.D., University of California at Davis for the AZA Contraception Advisory Group. Agreement to provide pathology samples for any animals involved in chemical contraception.

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.

Reed, Holly, DVM. Point Defiance Zoo and Aquarium. AZA polar bear SSP. Blood samples provided for the determination of normal thyroid values in polar bears.

Ruhl, Stefan, D.D.S., Ph.D. State University of New York at Buffalo. Blood, saliva, and microbial samples from the oral cavity of lowland gorillas provided for a comparative study of human and hominid oral microflora.

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.

Spinks, Philip, Ph.D. Department of Evolution and Ecology, University of California at Davis. Blood samples submitted for evaluating genetic variation with *Curora trifascata*, Asian box turtles.

Van Horn, Russell C, Ph.D. Zoological society of San Diego. Spectacled bear fecal samples were provided for combined analysis of steroids and DNA.

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.

## **Cars for Conservation Fund**

A new method to secure funding for conservation projects was implemented in 2006. The “Cars for Conservation” program received \$0.25 from each parking fee collected. The funds generated are distributed to national and international conservation programs. A total of \$13,554.43 was distributed in 2008. Projects below receiving “Cars for Conservation” funding are notated **CFC**.

### **Financial support was provided to the following conservation organizations in 2008**

**Abbe-Freeland Wildlife Rehabilitation Center-** Major NYS wildlife conservation and rehabilitation center in Angelica, New York. Support provided through donation of materials and expertise in husbandry, shipping, management, etc

**Addax SSP, Antelope TAG, AZA-** Funding provided to aid in the re-introductory program for Addax antelope through the Sahara Conservation Fund. **CFC**

**American Livestock Breeds Conservancy-** Contributions to support the conservation of heritage livestock breeds.

**Amphibian ARK, IUCN/SSC Conservation Breeding Specialist Group-** Contributions for captive and in situ research in the husbandry and breeding of amphibians. **CFC**

**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. **CFC**

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

**Bear Conservation Fund-** Contributions for the research and conservation of in situ bear populations **CFC**

**Elephant Managers Association (EMA)** Financial support provided for the 28<sup>th</sup> annual Elephant Managers Association Conference. **CFC**

**El Valle Amphibian Conservation Center (EVACC)** In-situ and ex-situ Panamanian amphibian conservation was supported in 2008. The Goals of EVACC are to save 12 species of Panamanian endemic frogs for education, display, and the future maintenance of the species. The Buffalo Zoo supplied funding for the salary of one local Panamanian as an EVACC keeper for a year. Panamanian frogs were exhibited in the reptile house with an educational graphics package. **CFC**

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

**International Rhino Foundation-** Financial support provided for North American Save the Rhino Campaign which helps to conserve rhinos in the wild. **CFC**

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

**Kyoto University, Japan-** Contributions for in situ Japanese macaque research; radio collaring project. **CFC**

**National Elephant Center AZA-** Contributions for the development, construction, and operation of a 300 acre facility for the management and reproduction of AZA elephants

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

**Proyecto Titi-** Contributions for the conservation of the Cotton-top tamarin in Columbia. **CFC**

**Spectacled Bear Conservation Fund-** Contributions for the in situ study and conservation of Spectacled bears in Peru. **CFC**

**Wildlife Conservation Society, Bronx NY-** Contributions to support the world conservation programs of the NY Zoological Society. **CFC**

## **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 ©. The Buffalo Zoo works with 25 SSPs. The Buffalo Zoo also participates in 39 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 63 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 40 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*)

## Buffalo Zoo Conservation Programs Involvement

	CITES	USDI	SSP/PMP	Studbook	NY
<b>Mammals</b>					
tamar/scrub wallaby			PMP	X	
vampire bat			PMP		
ring-tail lemur	I	E	SSP	X	
ruffed lemur, black and white and red	I	E	SSP	X	
douroucouli/grey-legged owl monkey	II		PMP	X	
brown capuchin	II				
black howler	II		PMP	X	
squirrel monkey	II			X	
cotton-top tamarin	I	E	SSP	X	
golden lion tamarin	I	E	SSP	X	
DeBrazza's guenon (loan out)	II		SSP	X	
white-faced saki	II		PMPS	X	
Japanese macaque	II	T	SSP	X	
black ape	II		SSP	X	
mandrill	I	E		X	
w. lowland gorilla	I	E	SSP	X	
two-toed sloth			PMP	X	
giant anteater	II		PMP	X	
Brazilian agouti			PMP	X	
capybara			PMP	X	
prehensile-tail porcupine			PMP	X	
maned wolf	II	E	SSP	X	
spectacled bear	I		SSP	X	
polar bear	II		SSP	X	
grizzly bear	II	T			
Kodiak bear	II	T			
red (lesser) panda	I		SSP	X	
slender-tailed meerkat			PMP	X	
river otter	II		PMP	X	
spotted hyena			PMP	X	
Eurasian lynx	II				
serval	II		PMP	X	
ocelot	I	E	SSP	X	
African lion	II		SSP		
Siberian tiger	I	E	SSP	X	
snow leopard	I	E	SSP	X	
California sea lion			PMP	X	
Indian elephant	I	E	SSP	X	

rock hyrax			PMP	X	
common zebra			PMP	X	
South American tapir (loan out)	II	E	PMP		
great Indian rhinoceros	I	E	SSP	X	
collared peccary			PMP	X	
guanaco	II				
reticulated giraffe			PMP	X	
gaur (loan out)	I	E	SSP	X	
addax	I		SSP	X	
	CITES	USDI	SSP	Studbook	NY
roan antelope			PMP	X	
gemsbok			PMP	X	
bighorn sheep		E			
Birds					
roseate spoonbill			PMP	X	
red-breasted goose	II				
black-necked swan	II				
cinereous vulture	II		SSP	X	
Harris hawk (Education)	II				
blue and gold macaw (Educ)	II				
Senegal parrot (Education)	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 lorikeet	II				
red lory	II				
dusky lory	II				
yellow-streaked lory	II				
Forsten's lorikeet	II				
Lady Ross' plantain eater			PMP	X	
great horned owl (Educ)	II				
snowy owl	II		PMP	X	
blue-crowned mot mot			PMP	X	
trumpeter hornbill			PMP	X	
chestnut-mandible			SSP	X	

toucan					
Pekin robin	II		PMP	X	
speckled mousebird			PMP	X	
<b>Reptiles</b>					
three-striped box turtle	II		PMP	X	
Annam leaf turtle					
giant So Am river turtle	II	E			
yellow-spotted river turtle	II	E			
S American red-footed tortoise	II				
pancake tortoise	II		PMP	X	
desert tortoise	II	T			
gopher tortoise	II	T			
eastern box turtle (Educ)	II				
American alligator	II	T			
dwarf caiman	II				
Mexican beaded lizard	II		PMP	X	
gila monster	II				
Egyptian spiny-tail lizard	II				
fence lizard					T
Parson's chameleon	II				
modest day gecko	II				
	CITES	USDI	SSP	Studbook	NY
prehensile-tailed skink	II		PMP	X	
black tree monitor	II		PMP	X	
Virgin Islands boa	I	E	SSP	X	
emerald tree boa	II				
sand boa (Education)	II				
reticulated python	II				
olive python	II				
ball python (Education)	II				
eastern indigo snake		T	PMP	X	
king cobra	II				
Arizona ridgenose rattlesnake			PMP	X	
Mexican lance-headed rattlesnake			PMP	X	
e massasauga rattlesnake			SSP	X	E
<b>Amphibians</b>					

Japanese giant salamander	I	E			
Puerto Rican crested toad		T	SSP	X	
green/black poison dart frog	II				
blue poison dart frog	II		PMP	X	
yellow-banded poison dart frog	II				
bicolored poison dart frog	II				
Panamanian golden frog	I	E	PMP	X	
golden mantella	II		PMP		
<b>TOTALS</b>	<b>86</b>	<b>29</b>	<b>25 SSPs 39 PMPs</b>	<b>63</b>	<b>2</b>

Reviewed 23 Dec 2008

## 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

Pangolin, Aardvark, Xenarthra 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

Pigeon and Dove TAG

Raptor TAG

Turaco TAG

Amphibian TAG

Chelonian TAG

Crocodylian 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

Southeast Asian CAP

Venezuela CAP