ANATOMY & BEHAVIOR

Explore our expansive collection of replica skulls and skeletons, rare or endangered species, and endless natural bone specimens. Call today for a catalog, or view our entire collection online at skullsunlimited.com!
FEATURES
8 PARTNERING TO SAVE THE FLORIDA PANTHER
Brandon Speeg, Karen Meeks, Dr. Scott Citino, Dr. Linda Penfold, and the Florida Fish & Wildlife Conservation Commission
12 FLORIDA AQUARIUM: RESTORATION OF RESILIENT CORAL COLONIES TO THE FLORIDA KEYS
Margo McKnight
14 CONSERVING VULTURES
Richard P. Reading, PhD
16 CONSERVATION IN YOUR BACKYARD
A Small Zoo’s Perspective
Jenny Barnett
18 MANED WOLF CONSERVATION
In Mar De Ansenuza Reserve, Córdoba, Argentina
Paula Gonzalez Ciccia
20 IN MEMORIAM
Russell Greenberg,
Smithsonian National Zoo
28 ANIMAL WELFARE
Jill Mellen
30 INSPIRING THE NEXT GENERATION OF ANIMAL CARE PROFESSIONALS
Ella Casey

IN EVERY ISSUE
3 A MESSAGE FROM THE PRESIDENT & CEO
6 CONSERVATION & RESEARCH
21 MEMBER NEWS
26 GREEN TALES
27 CONSERVATION SPOTLIGHT
32 A MESSAGE FROM THE CHAIR OF THE BOARD
33 BIRTHS & HATCHINGS
38 EXHIBITS
40 ANNOUNCEMENTS
43 MEMBER UPDATES
45 INDEX OF ADVERTISERS
47 CALENDAR

CONNECT
January 2014
ASSOCIATION OF ZOOS & AQUARIAIMS

Important components of Denver Zoo’s vulture conservation programs in both Mongolia and Botswana include education and outreach campaigns, work with policy makers and capacity building among local people. Local and Denver staff members educate people about the importance of vultures as nature’s recyclers, the benefits of removing carcasses from the landscape, the dangers of spreading poisons and pesticides and the risks that lead ammunition poses. The Zoo also works with officials to encourage the use of non-lead ammunition, to increase anti-poaching activities and to pass laws and regulations to ensure the survival of vultures.

Lappet Faced Vulture © R. Reading, Denver Zoo
Your support has helped the International Elephant Foundation contribute over $3 million to elephant conservation worldwide. Thank you to our many partners.
The rapid growth in wildlife crimes over the past several years is well documented. For example, it is estimated that 35,000 are slaughtered each year for their ivory. Much work is being done to stop the killing, stop the trafficking and stop the demand. It is this last area — stopping the demand for illegal wildlife products — where AZA-accredited zoos and aquariums can be particularly effective. One such example is the Wildlife Conservation Society’s (WCS) 96 Elephants campaign, with AZA and many of its members as committed partners. Please visit www.96elephants.org to take action.

AZA-accredited zoos and aquariums have an increasingly important role to play in engaging important audiences in their efforts to save species. The assets that AZA members possess — unique and inspiring collections; 180 million visitors; strong partnerships with federal, state, and local governments, and international NGOs; and talented and dedicated staffs — make AZA-accredited aquariums and zoos a keystone on which to build a successful effort to conserve the planet’s wildlife and wild places.

Pressure on wildlife and wild habitats from trade, population growth, climate change and other factors are only increasing. This makes the field conservation work, educational programming, and advocacy efforts of AZA-accredited aquariums and zoos vitally important. In 2012, AZA accredited institutions invested $160 million in field conservation projects around the world, bringing a three-year total spend on field conservation to $450 million.

This year’s Mid-Year Meeting is being hosted by the Memphis Zoo in Memphis, Tenn., an AZA member committed to wildlife conservation and to bringing colleagues and partners together to advance this mission. The Mid-Year Meeting features strong programming and a host of AZA Committee meetings, workshops and networking opportunities. I look forward to seeing you there.

Jim Maddy

A MESSAGE FROM THE PRESIDENT & CEO
AZA STAFF

CONNECT STAFF
Tim Lewthwaite, Editor
Lisa Cadigan, Designer, Cadigan Creative

CONNECT EDITORIAL BOARD
Melinda Arnold, Dickerson Park Zoo
Steve Feldman, Senior Vice President, External Affairs
Martha Fischer, Saint Louis Zoo
Julie Larsen-Maher, Wildlife Conservation Society
Tim Lewthwaite, AZA Publications Manager
Kristin L. Vehrs, AZA Executive Director

AZA STAFF
Jim Maddy, President & CEO
Kristin L. Vehrs, Executive Director
Paul Boyle, PhD, Senior Vice President of Conservation & Education
Steve Feldman, Senior Vice President, External Affairs
Jill Nicoll, Chief Operating Officer
Deborah Luke, PhD, Vice President Animal Conservation
Denny Lewis, Vice President Accreditation Programs
Jennifer Keaton, Vice President, Congressional Affairs
Steve Olson, Vice President Federal Relations
Jay Vestal, Vice President of Sales & Marketing
Phil Wagner, Senior Vice President of Finance
Candice Dorsey, PhD, Director, Animal Programs
Jennifer DiNenna, Manager, Accreditation
Jennifer Fields, Communications Coordinator
Allegra Formento, Marketing Assistant
Rachel Gauza, Citizen Science Program Specialist
Rebecca Greenberg, Program Assistant, Conservation & Science
Shelly Grow, Director, Conservation Programs
Melissa Howerton, Vice President, Conferences & Membership
Tim Lewthwaite, Publications & Brand Manager
Nette Fletcher, Director of Conservation Education
Barbara Pueschel, Board & Committees Liaison
Nancy Ramos, Receptionist
Amy Rutherford, Professional Development Program Manager
Ana Maria Sanchez, Controller
Barbara Skewes, Manager, Member Information Services
Sarah Sullivan, Manager, Digital Media
Gina Velosky, Manager, Business Development & Marketing
Cheryl Wallen, Meeting Planner
Jacquelyn Wright, Program Assistant, Member Services

Association of Zoos & Aquariums
8403 Colesville Road, Suite 710
Silver Spring, MD 20910
301-562-0777 (phone); 301-562-0888 (fax);
www.aza.org

AZA BOARD OF DIRECTORS

2013 - 2013

OFFICERS

CHAIR
Jackie Ogden, PhD
Vice President, Animals, Science and Environment,
Walt Disney Parks and Resorts
Ph: (407) 938-2831, E-mail: jackie.ogden@disney.com

CHAIR ELECT
Dennis E. Pate
Executive Director and CEO, Omaha’s Henry Doorly Zoo and Aquarium
Ph: (402) 738-2014, E-mail: dpate@omahazoo.com

VICE CHAIR
Steve Burns
Director, Zoo Boise
Ph: (208) 384-4125, x203, E-mail: sburns@cityofboise.org

PAST CHAIR
Tom Schmid
President and CEO, Texas State Aquarium
Ph: (361) 881-1242, E-mail: tschmid@txstateaq.org

DIRECTORS

Jim Breheny
Executive Vice President and General Director, Zoos and Aquarium
Jonathan Little Cohen Director of the Bronx Zoo Wildlife Conservation Society
Ph: (718) 220-5101, E-mail: jbreheny@wcs.org

Lynn B. Clements
Director, Virginia Aquarium and Marine Science Center
Ph: (757) 385-0240, E-mail: ltclements@virginiaaquarium.com

Jim Bekkers
Managing Director, Monterey Bay Aquarium
Ph: (831) 647-6825, E-mail: jhekkers@mbayaq.org

Gregg Hudson
Executive Director and Chief Executive Officer, Dallas Zoo Management, Inc.
Ph: (469) 554-7510, E-mail: ghudson@dallaszoo.com

Dennis W. Kelly
Director, Smithsonian National Zoological Park
Ph: (202) 633-4442, E-mail: KellyD@si.edu

Kevin Mills
President and CEO, South Carolina Aquarium
Ph: (843) 579-8555, E-mail: kmills@scaquarium.org

Amos Morris
Zoo Director, Mesker Park Zoo and Botanic Garden
Ph: (812) 435-6143 x401, E-mail: amorris@meskerparkzoo.com

Douglas G. Meyers
President and CEO, San Diego Zoo Global
Ph: (619) 557-3999, E-mail: dmeyers@sandiegozoo.org

John T. Walczak
Director, Louisville Zoological Garden
Ph: (502) 238-5335, E-mail: john.walczak@louisvilleky.gov

© 2014 Pentair Aquatic Eco-Systems, Inc. All Rights Reserved.
Email: WaterLifeDesign@Pentair.com
2395 Apopka Blvd, Apopka, FL 32703
Web: WaterLifeDesign.com
Phone: 407-472-0525

Pentair Aquatic Eco-Systems can provide everything you need to support the aquatic life in your zoo or large-scale aquarium, including:

**DESIGN**
Receive expert advice on exhibit concept development, design and layout.

**SUPPLY**
We offer pumps, filters, sterilization equipment and more, and can provide custom skid filtration systems and control systems.

**INSTALLATION**
Our installation team includes master plumbers and project managers who fully understand the special needs of aquatic system construction where animal welfare is critical.

**PROJECT CONSULTATION**
We draw on our extensive field experience to make sure your system is not only functional but also easy to use and maintain.
ANIMAL WELFARE AND DESIGN OF REINTRODUCTION PROJECTS

Reintroductions and translocations frequently involve trade-offs between the welfare of individual animals and the support or reestablishment of threatened or endangered species. For example, mortalities of reintroduced animals may be high when compared to similar animals remaining in captivity. This study sought to determine the extent to which animal welfare has been explicitly incorporated into the design of vertebrate reintroduction projects. The study examined 199 peer-reviewed and gray literature papers and found welfare issues identified in 67 percent of those publications; but animal welfare was explicitly identified in only six percent. The most common mitigation of implicit or explicit welfare issues was a ‘soft release’ (e.g., acclimation enclosures, food and shelter provisioning after release) aimed at increasing survival. The study builds a strong case for an explicit consideration of welfare issues at all stages of any reintroduction or translocation project.

Harrington, LA, Moehrensclager, A, Gelling, M, Atkinson, RPB, Hughes, J, MacDonald, DW. 2013. Conflicting and complementary ethics of animal welfare considerations in reintroductions. Conservation Biology 27: 486-500. Correspondence to: lauren.harrington@zoo.ox.ac.uk.
PRIORITY SETTING IN CONSERVATION

The difficult, often vexing issue of how to prioritize conservation projects and initiatives is now a major focus of conservation science. The paper identifies six common missteps in developing and prioritizing conservation projects: not acknowledging that a conservation project is a prioritization, ill-defined problems, not prioritizing actions, arbitrariness, hidden value judgments, and not acknowledging risk of failure. The most common misstep is trying to solve an ill-defined problem. Objective approaches to prioritization and simple tactics for avoiding these six common missteps are clearly and succinctly outlined.

Game, ET, Kareiva, P,Possingham, HP. 2013. Six common mistakes in conservation priority setting. Conservation Biology 27: 480-485. Correspondence to: egame@tnc.org

BIOBANKING FOR AMPHIBIAN CONSERVATION

This paper reviews the issues related to biobanking for amphibians including the role of zoos and aquariums. It identifies the prospects and challenges for cryopreservation of cells, tissues, and gametes. It lays out a clear set of goals and priorities that offer a baseline against which request for samples and participation can be weighed.


AFRICAN LION CONSERVATION AND FENCING

Physical separation of activities that result in human wildlife conflict is one means of minimizing that conflict. Fencing of wildlife populations is one way to achieve this physical separation but fences are often viewed as counter to a broader conservation ethic. This study tests the effectiveness of fencing on African lion conservation status at 42 sites in 11 countries while controlling for a wide range of human impact and management tactics. Fenced reserves maintain lion populations closer to their potential densities and at much lower costs per unit area than unfenced areas. Moreover, lions in fenced reserves are limited largely by their own population size relative to available space and resources. In contrast, lions in unfenced reserves are highly sensitive to human population densities and are frequently impacted by factors that are independent of their population size and resources. While fenced populations project to be stable for the next 100 years, more than half of the lion populations in unfenced reserves project to decline precipitously in the next 20-40 years.

PARTNERING TO SAVE THE FLORIDA PANTHER

As the conservation community commemorates the 40th anniversary of the Endangered Species Act (ESA), a collaboration of government agencies, zoos and non-governmental organizations continue the work of saving one of the first listed species. Seven years before the passage of the ESA, the Florida panther was initially listed as a threatened and endangered species, compiled under the precursor Endangered Species Preservation Act. At the time of listing, and after a century of persecution and exponential human population growth, Florida’s state animal numbered between five to 20 adults isolated south of the Caloosahatchee River. Forty years later, approximately 100 to 160 adults remain thanks to the collaborative efforts of diverse stakeholders, including White Oak Conservation Center in Yulee, Fla., and other Association of Zoos and Aquariums (AZA) member organizations.

By Brandon Speeg, Karen Meeks, Dr. Scott Citino, Dr. Linda Penfold, and the Florida Fish and Wildlife Conservation Commission
White Oak encompasses 7,400 acres of forests and wetlands located along the St. Mary’s River in northeast Florida. Founded in 1982, and an AZA certified related facility since 1985, White Oak sustains imperiled animal species through innovative conservation breeding, research, education, and field programs. White Oak’s large and secluded property and successful felid programs make it an ideal facility for the rehabilitation and recovery of panthers.

The first Florida panther rehabilitations and releases were attempted at Zoo Miami in the early 1980s. White Oak’s involvement with efforts to save the Florida panther began in 1986 upon receiving a non-releasable male panther “Big Guy” that had been hit by a car. This began a partnership with the U.S. Fish & Wildlife Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FWC) that continues today. White Oak’s first rehabilitation and release came with the arrival of a nine-month old orphaned and injured female in 1987. Affectionately dubbed “Orphan Annie”, but officially known as FP 23, she recovered in a ten acre conditioning enclosure built in natural Florida upland pine habitat. After a year at White Oak, Orphan Annie was released into Big Cypress National Preserve and went on to produce two litters.

Despite small gains prescribed in the recovery plan, the panther population was still on the precipice of extinction, due in large part to inbreeding depression. Many panthers demonstrated visible signs associated with inbreeding, including a high percentage of cryptorchid males with poor sperm quality and an increasing prevalence of atrial septal defects. In 1992, White Oak organized and hosted a stakeholder meeting intended to move conservation planning through political and scientific gridlock regarding proposed genetic introgression. As a result, eight Texas cougar females were released into south Florida in 1994, with the objective of increasing genetic diversity and overall population health. After successfully breeding, the cougar females were removed from the wild after a prescribed time, and three came to White Oak to live out their lives. One of the Texas females still lives in a spacious enclosure at the age of 22.

White Oak staff participates in field work to capture male Florida panthers and assess reproductive parameters as part of the monitoring of the genetic introgression study. Information was gained by studying sperm recovered post mortem from panthers killed by vehicular trauma or inter-male aggression. Data on the reproductive traits of Florida panthers, to determine the influence of outbreeding on this population, was collected over a ten-year period and assessed in terms of the genetic heterozygosity and overall health. These important findings were published in Science (2010), describing for the first time the impact of this intervention in preventing the extinction of a species.

Panthers tested positive for feline leukemia virus (FeLV) during the 2002-2003 capture season and an outbreak followed in the Okaloacoochee Slough in south Florida. White Oak completed a safety and efficacy study on killed FeLV vaccine using captive pumas that was used as a part of the intervention strategy, which vaccinated captured panthers in a ring around the outbreak zone.

Perhaps the biggest success of White Oak and FWC’s rehabilitation and release program began with the rescue of an orphaned six-month old female kitten in 2002. FWC biologists found the cub FP113 lingering near a deer carcass that her mother had probably died defending. The kitten would have struggled to find and kill prey, and would be unprotected from territorial males and other predators. With the low number of panthers remaining in the wild, every individual female is important to the population and the FWC team captured the kitten to give her the best chance of survival. FP113 arrived at White Oak on October 24th and was placed in a small secluded enclosure to enable staff to monitor her closely during the crucial early period.

In the isolated enclosure, FP113 was fed a variety of prey, using strict protocols to reduce her association between food and humans. After six months in the conditioning pen, the now sub-adult panther was a capable hunter and ready to take her rightful place as the apex predator in southwest Florida. FP 113 would go on to become a crucial part of the wild panther population, producing at least 12 kittens identified by biologists. Biologists also know that at least one of her female offspring has gone on to produce litters of her own. Years after her release back into the wild, FP 113 is still rewarding the FWC and White Oak panther team for their hard work.

Despite the successful rehabilitation and release of 12 panthers since the program’s inception, Florida panther populations remain low due to human related geographical and political factors that restrict panther populations to small patches of suitable habitat and protected areas in southwest Florida. Intraspecific aggression (in large part due to limited suitable habitat) and vehicle collisions continue to be the leading causes of mortality and injury in free-ranging Florida panthers. As broader conservation strategies are put into place, White Oak and FWC continue to work together to save individual panthers and return them to the wild breeding population. Multiple AZA institutions in Florida have contributed to panther recovery by providing housing, rehabilitation, and pathology work. These facilities include Jacksonville Zoo, Zoo Miami, Disney’s Animal Kingdom, Tampa’s Lowry Park Zoo and Busch Gardens Tampa. The Florida panther story is an excellent example of how AZA institutions work collaboratively to tackle challenges related to restoring populations of endangered large carnivores.

Brandon Speeg, Conservation Coordinator, White Oak Conservation
Karen Meeks, Collections Manager, White Oak Conservation
Dr. Scott Citino, Head Veterinarian, White Oak Conservation
Dr. Linda Penfold, Director, South-East Zoo Alliance for Reproduction & Conservation

Florida Fish and Wildlife Conservation Commission also contributed to the article.
Where would YOUR birds and small mammals rather live?

Check us out online at www.cornerslimited.com
or call for a free catalog
1-800-456-6780

Corners Limited
CUSTOM CAGING SPECIALISTS
508 HARRISON • KALAMAZOO, MI 49007
(269) 345-7599 • FAX (269) 345-3305
The Fun Starts with K&K

As a respected provider of sports and recreation insurance products for over 60 years, you can purchase coverage from K&K with confidence. Thousands of clients choose K&K Insurance for quality coverage, a commitment to service, and reliable claims resolution—join the crowd and find out what K&K can do for you.

Visit our website today for more information.

- Volunteer Accident
- Directors & Officers Liability
- Workers Compensation
- Liquor Liability
- Excess Liability
- Package Policies
- General Liability
- Property
- Inland Marine
- Automobile & Crime

K&K INSURANCE
Insuring the world’s fun!
800-553-8368
www.kandkinsurance.com

GRIZZLY RIDGE
AKRON ZOO

CONGRATULATIONS TO
THE AKRON ZOO
ON THE OPENING OF
GRIZZLY RIDGE!!

WDM Architects P.A. • 105 North Washington • Wichita, KS 67202 • 316.262.4700 • wdmarchitects.com
FLORIDA AQUARIUM: RESTORATION OF RESILIENT CORAL COLONIES TO THE FLORIDA KEYS

By Margo McKnight
Globally corals face dramatic manmade environmental challenges from ‘bleaching’ (loss of zooxanthellae) because of high temperatures or cold kills, damage from more powerful storms, insidious nature of oil spills and other pollutants. Both species of Acropora cervicornus (staghorn) and palma (elkhorn) are currently listed as threatened with a potential endangered status coming soon. It is estimated that they have declined by at least 97 percent. This presents a big problem because these two coral species are the primary building blocks for Caribbean reefs. Helping them adapt poses many challenges yet we cannot throw up our hands. The stakes are too high. It appears that on existing reefs some genotypes appear to be more resilient to these new environmental pressures. If we could assist these more robust genotypes by giving them a head start and restoring greater numbers to reef ecosystems we could in theory hedge Nature’s bets.

So how does this happen? Two words, Ken Nedimyer. Ken is president and founder of the Coral Restoration Foundation. Ken started with plastic buckets housing three larval settlers in 1996. By 2013 there are tens of thousands of coral in underwater nurseries with 107 different genotypes identified. In addition to his dedication to corals, Ken is the consummate collaborator bringing together stakeholders from private non-profits like FLAQ to large universities like the University of Florida. We began our coral journey in 2001 recusing a few corals from a seawall in Key West. Under the direction of Dr. Ilze Berzins, then vice president of biological operations, and Craig Watson (TAL), it did not take long for FLAQ to wade deeper and deeper into coral conservation.

In the early morning hours of August 2013, three days after the full moon, a multitude of divers were hanging suspended in the water hovering above Molasses Reef waiting for one of nature’s amazing spectacles, a coral spawn. The long hours of preparation and time waiting in the water paid off as the spawning activity was so robust that the gametes were simply scooped up from the water column with ease. On the CRF nursery reef not far away clusters of corals were ‘tented’ overnight to collect specific genotypes and allow cross fertilization. The success of the 2013 spawn was transmitted through excited phone calls, text messages and e-mails as approximately 300,000 gametes were collected over two nights a small percentage of the natural production yet a huge number to work with for conservation purposes.

At the same time an additional important experiment was taking place on shore in the CRF labs. A few weeks preceding the expected coral spawn date, dozens of genotypes of staghorn coral from the CRF nursery were brought into the lab and placed in tanks. The animals were selected because of identified gamete production and the likely hood to spawn, hopefully at the same time, as the colonies in-situ. Adding to the success and excitement in the water, the lab colonies spawned as well. This is an important step given that the goal of this project is to stimulate spawning of corals in on-shore nurseries to bolster wild reef colonies.

As the corals were being cross fertilized, on the reef, in jars and in tanks, the next stage was the development of larvae. This step was also a success. Now the free swimming larvae need to settle onto substrate and morph into a coral polyp. This settling phase is unsettling as it is not clear yet what makes them fall out of the water column and move into their sessile lifestyle. Once settled transporting them becomes more difficult. As of this writing, the settling of polyps has been heralded as successful as we closely monitor the settled larvae, and so far development is on track. Ultimate success will be when the colonies of the resilient genotypes are restored to reefs and in turn spawn in the wild enhancing the number of animals with greater adaptive abilities. We are on our way.

The FLAQ, TAL and CRF were not alone in this successful season. Mystic Aquarium and the California Academy of Science not only helped in the field but received (permitted) spawn and SeaWorld Orlando, Akron Zoo and Disney’s Living Seas lent able bodies and minds. I especially want to thank Rich Ross for the spectacular and invaluable images and video. We cannot do this alone. Funding expertise and willing hands and minds are needed. So many of our staff make this program possible but Rick Klobuchar and John Than are the heart and soul of this effort here at FLAQ. We should also thank Charles D. as well for figuring this out a long time ago.

Margo McKnight is the Vice President of Biological Operations at the Florida Aquarium
CONSERVING VULTURES

They work fast. Having crossed the border into Botswana just before dawn in a mokoro canoe, four men hack the long, curved tusks off the bull elephant’s skull. If they don’t get caught, the poachers will make a small fortune, though not nearly as much as the middleman who pays them. Looking up, the men curse the vultures circling above them. The birds anticipate a hearty meal of poached pachyderm. This telltale sign could bring rangers or, worse, soldiers right to the slaughter. So when the poachers finish their dirty deed, they lace the carcass with pesticides to kill the birds that might well land them in jail.

Hundreds of kilometers south, a cattle rancher chases off a pride of lions off the remaining uneaten half of one of his prized bulls. Angry at the continued loss of livestock to predators from the adjacent game reserve, he injects the remaining carcass with poison. As he pulls away, vultures waiting patiently in the surrounding trees, glide down to begin their final meal.

By Richard P. Reading, PhD
A
t the neighboring ranch and private hunting reserve, a
guide removes the guts from a prize greater kudu that
his client has just killed. Thrilled to get the huge, spiral-
ing horns and beautiful pelt, the hunter doesn’t want the meat,
but the guide sure does. Once the hunter and guide clear out,
vultures descend on the gut pile and devour it within minutes.
What they cannot realize is that they have also ingested lead frag-
ments from the bullet that killed the kudu. They will slowly die
of lead poisoning.

Vultures across the globe vultures face a highly uncertain fu-
ture. These three vignettes represent some of the greatest threats
to vultures today: intentional poisoning by poachers worried that
vultures will reveal their location; non-target poisoning by ranch-
ers frustrated by conflicts with carnivorous mammals; and unin-
tentional poisoning by hunters and game ranchers who use lead
ammunition to hunt animals.

At Denver Zoo we work to conserve vultures on three contin-
ents. Our two most robust programs focus on Cinereous vultures
(CVs, Gyps monachus) in Asia and several vulture species in
southern Africa. We also breed Andean condors (Vultur grphus) to
reintroduce and restore them in Columbia. We experience daunting
challenges in partnership with exceptional collaborators. But
the work is important and rewarding.

In 2003, Denver Zoo took up the vulture cause starting in
Mongolia’s Ikh Nart Nature Reserve as part of our larger program
to understand and conserve this beautiful northern Gobi Desert
ecosystem. Unlike Europe and western Asia, where the species
has declined dramatically, CVs continue to fare well in Mongolia.
Ikh Nart supports one of the world’s largest breeding populations.
Main threats to CVs and other Eurasian vultures include uninten-
tional poisoning, direct persecution by herders who mistakenly
believe that they prey on livestock and humans disturbing nest
sites. We initially studied CV nesting ecology focusing on the fac-
tors that influence nesting success – raising a chick to fledgling
age. Today, we also study the birds’ migration and foraging pat-
terns and survivorship.

Every year we monitor approximately 70 vulture pairs (more
than 600 pairs since the study began) and, to date, have put
solar-powered, backpack telemetry units on nine adults and nine
fledglings. Our findings have shed light on CV ecology. More im-
portantly, they have led to concrete conservation outcomes. For ex-
ample, our data convinced local governments to expand Ikh Nart to
include important vulture habitat. Working with colleagues from
South Korea we also discovered that only immature vultures seem-
ingly migrate, primarily back and forth from Mongolia to South
Korea. How young birds learn these migratory routes remains a
mystery we hope to unravel. In the meantime, mapping migra-
tion patterns will help us identify important habitats to protect in
China and North Korea.

In 2012, we began our Botswana vulture project, which is de-
veloping rapidly. We study the ecology of lappet-faced vultures (LFVs,
Torgos tracheliotos), white-headed vultures (WHVs, Trigonoceps oc-
cipitalis) and white-backed vultures (WBVs, Gyps africanus). The
IUCN lists LFVs and WHVs as Threatened and WBVs, formerly the
most common vulture in southern Africa, as Endangered due to
their rapid declines. We test blood lead levels of all birds we cap-
ture and our initial results are alarming. Almost a quarter of the
birds we tested have a high quantity of lead coursing through their
blood. High lead levels are fatal and lower levels reduce reproduc-
tion and survivorship. Thus far, of the three species, mostly only
WBVs show signs of elevated lead levels, some higher than our
equipment can read. About 25 percent of the WBVs – the fastest
decaying of the three species – we tested show dangerously high
lead levels. Our findings promise to help us evaluate the risks these
birds face and the factors influencing survival and nesting success.

In the last two years, we have placed telemetry data transmitter
units on eight LFVs and two WHVs (the latter for the first time ever)
and collected blood samples from 218 WBVs, 12 LVs and two WHVs
in several locations across Botswana to test for lead levels. Our
transmitted birds range over most of Botswana and some into
neighboring Namibia and South Africa. We hope to fit additional
birds with telemetry units in 2014, including on WBVs, and to
begin tracking nesting ecology for all three species.

Important components of our programs in both Mongolia and
Botswana include education and outreach campaigns, work with
policy makers and capacity building among local people. Local
and Denver staff members educate people about the importance of
vultures as nature’s recyclers, the benefits of removing carcasses
from the landscape, the dangers of spreading poisons and pesti-
cides and the risks that lead ammunition poses. We also work with
officials to encourage the use of non-lead ammunition, to increase
anti-poaching activities and to pass laws and regulations to ensure
the survival of vultures. Finally, we firmly believe that long-term
success requires developing local talent. Our young Mongolia,
Korean and Botswana students and collaborators hold the best
hope for saving the vultures that serve their countries.

Richard P. Reading, PhD is the Vice President for
Conservation at the Denver Zoo

GoApe! Treetop Adventure

Revenue and Attraction
At No Cost!

1 Adventure Course Provider in the World

Locations Across the USA

415.553.0769 and newcourses@goape.com

GoApe.com
Binder Park Zoo is situated in a rural community in Battle Creek, Mich. We are fortunate to be the stewards of 433 acres of natural habitat. Though we have a small animal collection, we have a large amount of land with complex habitats. Our property consists of thick forests with open grassland and plentiful wetlands that include a rare prairie fen habitat. The Zoo is self-supporting and receives no tax dollars. We must run like a small business and keep a balanced budget as we rely on gate fees, gift sales, concession sales, donations and grants to fund our operation. This can be a challenge when it comes to supporting conservation programs.

We believe conservation has to begin in our own backyard and that is our main focus. While we participate in over thirty-six American Zoo and Aquarium (AZA) Species Survival Plans® (SSPs) and contribute funds to several SSP endorsed conservation programs, we believe our biggest impact is right here in Michigan. For over twenty years, we have partnered with Michigan State University and the Kellogg Biological Station to breed and re-introduce trumpeter swans back into the state. Staff members work closely with the Michigan Department of Natural Resources to monitor and hand-rear the endangered piping plover on the shores of Lake Michigan every year. We are a partner in the Michigan Bird Conservation Initiative, a cooperative program between state agencies, zoos and conservation organizations, to promote and provide information on bird conservation.

By Jenny Barnett
in our state. Working with the U.S. Forest Service, we provide staff each year to monitor populations of the Karner Blue butterfly, found only in a few counties in Michigan.

One of our more recent efforts involves the Kirtland’s warbler (Dendroica kirtlandii), a bird with a total reliance on the jack pine forest ecosystem which, in turn, is totally dependent on fire. The warbler is picky and will only nest on the ground at the edge of thick, shrubby jack pines between five and twenty years old. Wildfires naturally regenerate this habitat of deep thickets intertwined with large openings. The Kirtland’s warbler was found exclusively in the northern lower peninsula of Michigan where jack pine and wildfires were once common. The bird has probably always been rare, as it was not even discovered until 1903 in Oscoda County. Until recently, the only nesting sites ever found were within a sixty mile radius of the original 1903 sighting. Due to the introduction of homes and businesses into the Kirtland’s range, fire suppression became the norm and wildfires were no longer allowed to burn naturally. When fire suppression limited the warbler’s habitat, their numbers began to decline. They were dealt a second blow when brown-headed cowbirds (Molothrus ater) began to parasitize their nests much more easily. By 1971, there were only 200 pairs of Kirtland’s warblers left, landing the bird on the federal endangered species list.

The U.S. Fish and Wildlife Service, Michigan Department of Natural Resources, U.S. Forest Service and several other conservation organizations and universities took action and began a 40-year effort to recover this rare species. The program has focused on new forest management techniques, brown-headed cowbird population control and public education. In 2001, an annual census was created to count the number of singing males in established territories. Binder Park Zoo has partnered with Michigan Audubon to provide trained staff to help monitor the warbler populations. Each volunteer is required to participate for a minimum of five years, eliminating the need to continuously train new volunteers. When there are new recruits, they are partnered with an experienced volunteer for their first year and the training is very hands on. Kirtland’s warblers winter in the Bahamas and make their way back to Michigan in mid-May. The census work is conducted for one to two weeks in early June, after the birds have paired up for the season. The observers are out before first light, listening for singing males in remote but specifically designated areas. Orienteering skills are required and the terrain can be difficult to navigate. Since the brush is extremely thick, it can be very challenging to actually see the Kirtland’s warbler. Listening for the singing males is a much more effective way to count the birds. As of 2012, there were over 2,000 established pairs recorded during the census, greatly exceeding the original goal of re-establishing 1,000 pairs in the state. Thanks to new forest management techniques, a few warblers have even been found in Wisconsin and Ontario, Canada. There has been discussion recently about taking the warbler off the endangered species list in the near future. Working with local conservation programs is not only more affordable for small zoos, it is also extremely rewarding as the impact is felt throughout the community. Making a difference does not mean you must travel thousands of miles. There is no place like home to contribute to a conservation project.

Jenny Barnett is the Director of Wildlife, Conservation and Education at the Binder Park Zoo.
MANED WOLF CONSERVATION
In Mar De Ansenuza Reserve, Córdoba, Argentina

The maned wolf (*Chrysocyon brachyurus*) was classified in 2006 as an endangered wild canid in Argentina by the International Union for Conservation of Nature (IUCN) and it is classified as Critically Endangered by the Argentinean Mastozology Association (Sarem, 2012).
Maj or threats to the conservation of the maned wolf include traffic accidents, habitat destruction caused by agricultural activities, persecution as predators of livestock, and diseases from domestic dogs (Rodden et al., 2004).

As a result of its solitary habits and relatively large home range, maned wolves live in low density areas. This is an important disadvantage when researching the population's ecology and wild behaviour. The known natural history of this species in Argentina is based on anecdotal evidence gathered over large temporal and spatial scales. The ecological and behavioural information comes mainly from protected areas in Brazil. There is little available information about the species and many of the conservation actions are based on poor biological and ecological information (Soler, 2009).

Little is known of the maned wolf’s status in the province of Córdoba. This species was considered extinct in the area decades ago, but the presence of some individuals has been recorded and now it is a known that they live in the area.

Fundación Temaikén’s Maned Wolf Conservation Project’s vision consists of ensuring the presence of the species in their habitats, and engendering respect and appreciation for them in local communities now and in the future. Fundación Temaikén’s contributes to maned wolf conservation by treating injured animals in a rescue and rehabilitation center and through education and community outreach efforts aimed at decreasing the effects of human activities that are impacting the survival of this species.

In collaboration with the Environment Gubernamental Agency in the province, Fundación Temaikén is working on several different maned wolf conservation strategies.

Reintegration of Individuals that were Rehabilitated in the Center

The first maned wolf was reintroduced in 2010, after being confiscated and then moved to Temaiken for rehabilitation. The maned wolf was released in its natural habitat and monitored with VHF technology. An educational campaign was carried out to support this action.

Field Studies to Determine the Relative Abundance of the Species

Fundación Temaikén’s developed a fingerprint and feces registration protocol that allows us to estimate the abundance of maned wolves in any given area. The MACN conducts genetic studies using feces to confirm the presence and number of animals in the region. During the monitoring to estimate the maned wolf’s abundance in the region, 72 km were covered in 13 transects. Sampling was conducted in grassland, open scrub and wetlands. The relative abundance of the species was 0.39 footprint/km. Sixty five and half percent of the evidence corresponds to footprints and 37.5 percent in feces.

In addition, in October 2013, we started a study with camera traps in places where the presence of the species was confirmed by indirect signals.

Diagnosis of the Species’s Social Perception in Local Communities

Social diagnosis is achieved by interviewing local representatives of different groups: landowners, hunters, farmers or smallholders, senior citizens, teachers, etc. This data collection completed a perception study that we started in 2009 (N:278) in which the 76 percent of the people who were interviewed said that they were interested in maned wolf conservation. We continued in 2011/12 with student interviews (N:579) about knowledge of the species, and we also develop interviews each time we worked in the field (N: 32).

Decrease the Effects of Human Activities

We developed different strategies in order to achieve this goal and to increase the positive perception and the value that local communities have of the species. We also worked to include landowners and farmers in the maned wolf’s conservation actions. We held regional workshops and have developed a conservation education, research and legislative policy plan in the province.

This project raises public awareness and appreciation of wildlife conservation issues, not only in local communities but in a national scale as well. Reintroductions and what people can observe with the monitoring of these animals are powerful tools that have allowed us to communicate a compelling conservation message. Educational activities stimulate conservation action, integrating children and adults in different strategies of the project. The project considers the community’s needs and the relationship between landowners and the environment, in order to engage them in management and conservation.

The outcomes of this project are:

- The determination of the relative abundance of the maned wolf in different habitats of Córdoba
- A full description of people’s perception and valuation in terms of knowledge, attitudes and actions.
- The implementation of management recommendations to decrease the threat to the population.
- The increase in the survival expectancy of reintroduced animals by involving local people in conservation.
- Increase the commitment of people and how they value the species as a key conservation actor. Grow the understanding of the important role the maned wolf plays in protecting the environment.

---

**Paula Gonzalez Ciccia** is the Threatened Species Conservation Program Coordinator at Fundación Temaikén. She can be reached at pgonzalez@temaiken.org.ar

---

**References:**


IN MEMORIAM
Russell Greenberg, Smithsonian National Zoo

Staff at the National Zoo are deeply saddened by the passing of Russell Greenberg, a pioneering ornithologist and founder of the Smithsonian Migratory Bird Center. Russ was a treasured friend, mentor and colleague. He was a visionary who was among the first to recognize a precipitous decline in Neotropical migratory bird populations, and an innovator who invented the concept of “shade-grown” coffee as a bird-friendly product, and for developing the rigorous science-based criteria now used in Smithsonian Bird Friendly coffee.

Russ displayed a precocious affinity to birds. He started his “life list” of bird sightings at age eight and maintained a passion for ornithology throughout his youth, hitchhiking around the Golden State in search of birds and earning a Bachelor’s degree and PhD in zoology from the University of California at Berkeley. Russ was known as an intellectual powerhouse, but also recognized for his exceedingly dry humor and flawless deadpan. Colleagues still talk about the color slide he liked to use in his talks – supposedly an aerial view of lowland tropical forest, but actually a photo of the broccoli display he took at the Berkeley Bowl supermarket.

Eschewing the charismatic species that attract so many birders, Russ dedicated most of his career to studies of nature’s more subtly colored fliers in lowland tropical forests and wetlands including wintering warblers, vireos, antwrens, swamp sparrows and rusty blackbirds. From observations of these under-appreciated species he derived a number of groundbreaking insights into avian behavior, evolution, and ecology. His most recent work brought ecological and evolutionary evidence to bear on an emerging and surprising recognition that, beyond their obvious utility for nabbing insects and hulling seeds, bird beaks serve an important role in the regulation of avian body temperature.

Russ was a strong advocate for science education and for inspiring the public about the wonders the great phenomenon of bird migration. He founded Migratory Bird Day, a festival to celebrate the arrival of migratory songbirds back to their northern breeding areas, now celebrated at 700 venues throughout the Western hemisphere. And Russ had a vision for making the Zoo’s Bird House the public “store front” highlighting the science and marvels of bird migrations. As we move forward with Bird House renovations in the years to come, “Marvelous Migrations” will help to ensure Russ’s legacy by bringing the ornithological sciences to millions of guests each year.

Russ was passionate about graduate and post graduate training, and he served as a mentor or advisor to more than 70 post-doctoral scholars, graduate students, and research interns. To honor him and to ensure his important work continues, we are establishing the “Russ Greenberg Fellowship Fund” at the Smithsonian Migratory Bird Center to support graduate and post graduate training. If you wish to contribute, please contact Lesli Creedon at creedonl@si.edu.
GEORGIA AQUARIUM HOSTS THE THIRD INTERNATIONAL WHALE SHARK CONFERENCE

Whale sharks (*Rhincodon typus*) may be the world’s largest fish, commonly growing to over thirty feet in length, but very little is known about their lives beneath the surface. As public interest in whale sharks grows due to an emergent and largely unregulated ecotourism industry and because of the eighteen million visitors that have passed through Georgia Aquarium’s in Atlanta, Ga., doors since 2005, the desire to understand these gentle giants is steadily increasing. That is why on 6-10 October 2013 Georgia Aquarium hosted the Third International Whale Shark Conference. After two previous conferences in Australia (2005) and Mexico (2008) where whale sharks are geographically found, 2013 marked the first time this conference was held at a landlocked location or at an aquarium. Presentation topics ranged from government regulation on whale shark harvesting and ecotourism to population and migration studies and beyond. Delegates were treated to two very special speaking engagements as well. Dr. Guy Harvey, who was also a presenting sponsor, premiered his movie “Whale Sharks of the Yucatan” and National Geographic photographer, Brian Skerry, was the keynote speaker. Approximately sixty delegates from about twenty countries made this conference a truly global experience.

DENVER ZOO PRIMATE TEAM WINS NATIONAL EXCELLENCE IN ANIMAL CARE AWARD

Denver Zoo in Denver Colo., announced that its “NeoMonks Team,” caring for new world monkeys, has been selected by the Association’s Awards Committee to receive an American Association of Zookeepers’ Jean M. Hromadka Excellence in Animal Care Award, which recognizes outstanding achievement in the animal care field and in fostering professionalism. The team of Jessica Grote, Samantha Smith, Jeremiah Cummins, Jennifer Hickman and Michelle Jordan was honored at last year’s National Conference in Greensboro, N.C., in September.

The Zoo’s team has excelled in the areas of animal husbandry, behavior management, teen volunteer and internship programs and public education. Their combined activities and participation in professional development, publishing papers and bison conservation project were also lauded.

The award was named for Jean M. Hromadka in memory of her outstanding contributions to the furtherance of AAZK through her work as president of the association. Winners must excel in areas including zoology, animal management, behavioral observation and daily record keeping on the species in their care.

CHARITY NAVIGATOR AWARDS CHATTANOOGA ZOO FOUR-STAR RATING

Charity Navigator, America’s largest and most-utilized independent evaluator of charities, has awarded the Chattanooga Zoo, in Chattanooga, Tenn., the prestigious four-star rating for good governance, sound fiscal management and commitment to accountability and transparency. The Chattanooga Zoo is currently the only zoo in Tennessee with a four-star rating.

“We are honored to receive Charity Navigator’s highest rating,” remarks Gary Chazen, Friends of the Zoo chair. “This award not only reflects our transparency and credibility, but more importantly our staunch commitment to our mission of education and conservation.”

Charity Navigator works to help charitable givers make intelligent giving decisions by providing information on more than five thousand charities nationwide and by evaluating their financial health. It calculates each charity’s score based upon several broad criteria, including how much is spent per dollar raised, what percentage of funds goes to programs vs. administrative and fundraising expenses, and the organization’s long-term financial health. It then assigns a rating from one to four, with four being the best rating.

Chattanooga Zoo Executive Director, Dardenelle Long, notes how, “A four-star rating from Charity Navigator acknowledges the Zoo’s commitment to act as a good steward of donor funds while reaffirming our role as a positive force in the local community.”

PHOENIX ZOO REACHES GOAL FOR CAPITAL CAMPAIGN

The Phoenix Zoo in Phoenix, Ariz., announced it has reached its goal of raising $22.5 million for its first major capital campaign, allowing it to fund several projects on the way toward creating a World Class Zoo for a World Class City.

With these funds, the Zoo has built or is building three major state-of-the-
art animal exhibits, a multi-purpose education and event center, a dramatic new front entry and a new volunteer and administration facility. It also funded a maintenance endowment to offset additional operational expenses from the new facilities.

These upgrades were necessary to ensure the Zoo – one of the nation’s largest private, nonprofit, accredited zoos – remains on the leading edge of wildlife conservation and education, and to provide an experience worthy of its guests.

The Zoo would like to thank each and every generous contributor through the years, from school children who donated jars of pennies on field trips to their biggest benefactors who gave bountiful gifts. We could not create a World Class Zoo for a World Class City without the support of our entire community.

The final contributions that allowed the Zoo to reach its capital campaign goal were a $500,000 grant from the Nina Mason Pulliam Charitable Trust and a significant estate gift from Bobbie Dapeer, a 30-year member of the Zoo and cherished volunteer.

“The Nina Mason Pulliam Charitable Trust is proud to be part of the Phoenix Zoo’s expansion,” said Carol Peden Schilling, chair of the Nina Mason Pulliam Charitable Trust. “Mrs. Pulliam’s love of animals made her a great friend to the Zoo in its earliest years, and the Trust continues her tradition of helping the Zoo expand and improve, becoming a world-class resource of conservation and education. Great institutions must always be growing and changing as the Zoo is today. Nina, my aunt, would be amazed at what the Phoenix Zoo has become for all of us, and for the welfare of the animal kingdom.”

“The Phoenix Zoo has long been a case study in great community involvement not only in fundraising for continuous improvement, but also in the creation of ways to bring the community together through the celebration of the world’s natural heritage,” said Dr. Edmund Portnoy, the trust’s director of grants programs, Arizona. “The Nina Mason Pulliam Charitable Trust, as a supporter of the Phoenix Zoo, from our first days, takes great pleasure in topping off the Zoo’s current capital campaign with a $500,000 grant, which will complete the costs of building the Sumatran Tiger Experience and Exhibit. It will create a new educational experience for the Zoo, and enhance the Zoo’s conservation efforts of a critically endangered species.”

Here is the list of Phase I projects and details:

- **Land of the Dragons** opened in late 2009 and features a tropical-themed environment and views of the planet’s largest lizard, the Komodo dragon. Sadly, the Zoo’s two mature dragons, Ivan and Gaia, passed away in September, but the Zoo earlier in 2013 received two baby lizards that eventually will be moved into the enclosure. Cost: $1,170,872.

- **The Orang-Hutan: “People of the Forest”** exhibit opened in early
2011 and showcases the intelligence and charisma of the Bornean orangutan, an amazing and endangered species. Cost: $4,018,033.

- The C.W. & Modene Neely Education and Event Center opened in June 2012 and provides educational, entertainment and event capabilities previously unavailable at the Zoo. Cost: $2,972,691.

- A new Entry Oasis opened in late 2012 and provides an exciting, inspirational welcome with a stroll across a renovated bridge, glimpses of resident turtles and waterfowl and a native species exhibit featuring vultures and tortoises. Cost: $3,775,895.

- The Doornbos Volunteer and Administrative Center will provide centralized office space for the Zoo’s dedicated staff and volunteer workforce. Previously, offices were housed in various mismatched and inefficient buildings and even off-campus. This center will showcase the Zoo’s commitment to conservation and green practices. This will break ground in January 2014. Cost: $6,200,000.

- The Sumatran Tiger Experience and Exhibit will provide capacity for several Sumatran tigers, one of the most rare and endangered of the five remaining tiger sub-species. Fewer than 500 survive in the wild. They love water, and their new home will include features for swimming and lounging. The Zoo will participate in the Species Survival Plan®, which monitors and manages the breeding of endangered species in zoos. This will break ground in April 2014. Cost: $2,000,000.

- Endowment: A strong endowment will generate interest income that will help offset the increased operating cost and provide resources for long-term maintenance of these facilities.

A permanent endowment fund perpetuates the financial health of the Zoo and diversifies the institution’s source of funding. Raised: $2,000,000.

What’s to come: Phase II of the Zoo’s capital campaign includes proposed projects to enhance the Africa Trail, Tropics Trail, Conservation Center and a 500-seat Children’s Trail amphitheater. In all, it will comprise 11 projects totaling $12.1 million.

ROGER WILLIAMS PARK ZOO HONORED FOR CONSERVATION WORK

Roger Williams Park Zoo in Providence, R.I., was honored on 5 October in Concord, N.H., by that state’s Fish and Wildlife Department for significant contributions to its Nongame and Endangered Wildlife Program endangered species recovery efforts. The Zoo was honored in the team category for its assistance and expertise in the Karner

When Every Shot Counts....

Virtually silent, versatile, lightweight and maintenance free humane darting equipment.
Anaesthetize • Medicate • Tranquilize Vaccinate and take biopsy samples.

979-203-6735 Info@DanInjectDartGuns.com www.DanInjectDartGuns.com

....why settle for less than the best.
blue butterfly, timber rattlesnake and New England cottontail areas of the program. The Zoo’s partners on these teams include regional state fish and wildlife and environmental management departments, universities, environmental organizations, and others. The award ceremony, which also honored other projects, took place at the Grappone Center in Concord, N.H.

The Karner blue butterfly must lay its eggs on wild lupine plants (*Lupinus perennis*) because that is the only plant the hatched larvae can eat. Karner blues historically could be found in 12 northern states and in Ontario, Canada. They can now be found only in Indiana, Michigan, Minnesota, New Hampshire, Ohio, New York, and Wisconsin. The lupine plant, so vital to the creature’s life cycle can only thrive in pine barrens with dry sandy and acidic soil, but those habitats have largely been destroyed during industrial and agricultural development. Now the lupine itself is endangered. Without it, the Karner blue larvae cannot survive.

Find details on Roger Williams Park Zoo’s contribution to this project here.

The timber rattlesnake plays an important predator role in deciduous forests, eating and therefore managing the populations of small mammals, birds and sometimes lizards, frogs and other snakes. In turn, these snakes provide an important food source for larger predators like hawks, bobcats, coyotes and foxes, and other snakes will prey on young timber rattlers. Nevertheless, as one of New England’s few venomous snake species, this animal’s survival is seriously threatened, primarily due to human fear and actions. It’s territories have declined from 31 states to 27, and populations have been completely extirpated from Maine, Rhode Island, central New Hampshire, most of Vermont, Long Island, and eastern and northern Ohio, and probably from Michigan and possibly from Delaware. Currently, nine states (including all New England states) and the Province of Ontario offer the timber rattlesnake some form of protection, listing it as threatened or endangered, or having a restricted or no-take policy. Fifteen other states have general regulations that protect some or all herpetofauna (the class of animals that includes amphibians and reptiles) and therefore the timber rattlesnake by default. This serious concern is multiplied by the fact that since 2009, timber rattlesnakes from separate populations in eastern, central and western Massachusetts have been found to have significant disease identified as fungal dermatitis. This disease has been previously documented by scientists as a cause of morbidity and mortality in both captive and free-ranging viperidae (venomous viper taxon) snakes.

The rare New England cottontail rabbit, a native rabbit once abundant throughout the region has dwindled severely since the 1930s when the non-native Eastern cottontail was introduced from Missouri by hunters. The species now is believed to be extirpated from Vermont, with sparse populations throughout the rest of New England. Recent population surveys conducted by staff wildlife biologists from the Rhode Island Department of Environmental Management’s Division of Fish and Wildlife and the United States Fish and Wildlife Service documented only one occurrence of New England cottontail in Rhode Island.
CARNIVORE DIETS

THE TORONTO ZOO CARNIVORE DIETS ARE THE RESULT OF MORE THAN 25 YEARS OF RESEARCH AND DEVELOPMENT. THESE DIETS ARE FORMULATED TO BE FED AS THE PRIMARY RATION IN THE FEEDING OF CAPTIVE CARNIVORES.

PRODUCT STANDARDS
Made with horse meat; No bones, cartilage, organs, skin or connective tissues are included in these diets. The meat originates exclusively from animals slaughtered in plants inspected by the Canadian Food Inspection Agency (CFIA).
Manufacturing is in accordance with the current provincial (Ontario) standards for meat processing and is subject to oversight by the Toronto Zoo Wildlife Nutrition Centre.

INGREDIENTS
Horse meat, Cellulose, tri-calcium phosphate, (Feline and Canine only), Limestone (small Carnivore only),
Toronto Zoo Vitamin-Mineral
Carnivore Premix, Vitamin E, Fatty Acid Supplement and Taurine.

PACKAGING
Frozen 2 kg (4.5 lbs.) bags at 10 bags per box.

TECHNICAL ASSISTANCE
Contact the Toronto Zoo Wildlife Nutrition Centre at (416) 392-5981

CALCULATED NUTRIENT LEVELS

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>All values in product</th>
<th>Feline Diet</th>
<th>Canine Diet</th>
<th>Small Carnivore Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>%</td>
<td>66</td>
<td>67</td>
<td>68</td>
</tr>
<tr>
<td>Crude Protein</td>
<td>%</td>
<td>22</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>Crude Fat</td>
<td>%</td>
<td>7.6</td>
<td>7.7</td>
<td>7.8</td>
</tr>
<tr>
<td>Crude Fibre</td>
<td>%</td>
<td>2.1</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Calcium</td>
<td>%</td>
<td>0.44</td>
<td>0.24</td>
<td>0.23</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>%</td>
<td>0.43</td>
<td>0.32</td>
<td>0.19</td>
</tr>
<tr>
<td>Magnesium</td>
<td>%</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
<td>28</td>
<td>28</td>
<td>29</td>
</tr>
<tr>
<td>Taurine</td>
<td>%</td>
<td>0.07</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>IU/kg</td>
<td>5860</td>
<td>6020</td>
<td>6800</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>IU/kg</td>
<td>70</td>
<td>94</td>
<td>71</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>IU/kg</td>
<td>580</td>
<td>600</td>
<td>670</td>
</tr>
</tbody>
</table>

ORDERS
The Toronto Zoo Carnivore Diets are prepared exclusively by

MILLIKEN MEAT PRODUCTS LTD.

7750 Birchmount Road, Unit 18
Markham, ONTARIO CANADA L3R 0B4
Phone: (416) 299-9600 or (905) 415-0060 Fax: (416) 299-5305
Email: millikenmeat@hotmail.com Web: www.millikenmeat.com

CONTACTS
Mr. Orlando and Mr. Jason De Rosa

The Toronto Zoo assumes no liability for the manufacture, packaging and delivery of the product

These products are not for human consumption.
I f we want to be an industry that lives our missions and inspires guests to make a difference, we have to tackle one very challenging area of operation: water use. Water efficiency is central to the long-range sustainability plan at the John G. Shedd Aquarium in Chicago, Ill. Located on Lake Michigan’s shores, the Aquarium is committed to Great Lakes protection and knows that it can lead regional water conservation efforts by example. By 2018, Shedd plans to reduce its use of new water by 50 percent over 2007 levels without compromising world-class animal care or guest experience. From 59 million gallons to 27 million in six years: How are we getting it done?

**SHEdd’S WATER EFFORTS**

In 2008, an external water audit provided Shedd staff with the data needed to analyze consumption levels. Once it was understood where the water was going, staff identified and addressed high-priority projects, which included commonsense steps like fixing leaks and replacing inefficient and old plumbing. The Aquarium invested in water-efficient fixtures and engaged staff in water friendly practices. Daily meter reads to spot anomalies and make timely repairs were also undertaken.

At Shedd, the cooling tower for the chiller plant accounted for about 50 percent of Shedd’s annual water use, so the old equipment was replaced with more efficient models that save money, energy and water. Staff made sure that when the new chiller plant and cooling tower was designed, that it had the capacity to handle the cooling load of smaller units and a newly created tenant condenser water loop that is tied directly to our main cooling tower condenser loop. After researching the issue, staff began reusing water from some fish systems as water make-up for cetacean systems.

Now, Shedd is exploring opportunities to reuse water or use rainwater in outdoor water features. Staff is also looking beyond the aquarium’s walls. Electricity production requires tremendous amounts of water. Shedd’s Master Energy Roadmap aspires to reduce our energy use 50 percent by 2020, which also helps us minimize water use.

**GETTING STARTED**

Where should your facility begin? We’d recommend starting with a third party water audit, then having your facilities staff review and analyze the data. Once you understand where water is used, you can choose “low hanging fruit” such as fixing leaks or installing water efficient fixtures. It is also important to continue monitoring water use so you can spot any fluctuations that may signal that something is awry. Educating, engaging and encouraging staff and guests to be part of water saving efforts are critical to the success of your reduction plan.

Once the easy changes are made, look beyond your facility. Many community partners and local experts can help your facility find innovative solutions to continue reducing your water use. In the end, the efforts will pay off – for your bottom line, but also for the impacts that you’ll have on the aquatic systems that support us all.

---

**Bob Wengel** is the Vice President, Facilities at the Shedd Aquarium

**Madeline Caldwell** is Assistant of Great Lakes & Sustainability
At the 2010 AZA Annual Conference, the Field Conservation Committee set an aspirational goal that in three years, every member institution would be dedicating three percent of its operating budget annually to field conservation. Each month, this feature will highlight the work of one of the zoos or aquariums that have achieved this goal and how they have made field conservation an integral part of the work they do.

MISSION
The mission of Tampa’s Lowry Park Zoo is “to connect people with the living earth.” All of the Zoo’s exhibits and programs are designed to engage and inspire visitors to treasure the natural world and act wisely on its behalf. The Zoo is also dedicated to serving as an educational resource for the community and providing an exciting, nature-based entertainment destination.

CONSERVATION EFFORTS
Tampa’s Lowry Park Zoo is dedicated to preserving the natural heritage we share as home to the most comprehensive collection of Florida’s endangered species found in any wildlife facility. In 2004, the State of Florida recognized our efforts and declared the Zoo a state center for Florida species conservation and biodiversity.

In addition to Florida wildlife, the Zoo is home to many species endangered or threatened in the wild from habitats similar to our own – Africa, Asia, Australia, and Central and South America. The Zoo participates in more than 90 AZA Species Survival Plans® (SSP).

“A modern zoo provides people unique opportunities to appreciate the variety of life on earth, to get close enough to care, and care enough to act,” said Craig Pugh, executive director/CEO, Tampa’s Lowry Park Zoo. “With the ability to manage animals outdoors, year-round, in natural habitats, we are connecting our collection to wild places in our efforts to leave the world a little better than we found it.”

TAMPA’S LOWRY PARK ZOO CONSERVATION FACTS

- The Zoo’s David A. Straz Jr. Manatee Hospital is the only non-profit acute care facility in the world specifically dedicated to manatees. To date, the Zoo has treated more than 325 manatees for a variety of severe illnesses and catastrophic injuries (more than six percent of the state’s estimated wild population). Nearly 200 of those patients have been successfully rehabilitated and reintroduced into Florida waters.

- Not only was the Zoo the first wildlife institution in North America to hatch a rare African shoebill stork chick in 2009 but they have also contributed to the conservation of this species in the wild, supporting researcher Jasson John and his study of the ecology of the shoebill in Tanzania.

- The Zoo welcomed its first successful okapi calf in January 2013. The Zoo provides annual funds to support the Okapi Conservation Project, founded in 1987, to secure a protected area in the Ituri Forest region of the Democratic Republic of Congo for the okapi and other native species.

- The Zoo is one of a select few that has a breeding group of endangered Puerto Rican crested toads. To date, efforts have produced more than 3,000 tadpoles returned to Puerto Rico for release into the wild in cooperation with the SSP. Additionally, several dozen toadlets have been raised at the Zoo to ensure continued genetic diversity of the species.

TLPZ CONSERVATION SUCCESS STORY

In the early 1950s, wildlife in the country of Swaziland had been severely decimated by rampant hunting and habitat loss. One family, the Reillys, recognized this loss and began a tireless crusade which led to the establishment of three National Parks and the beginning of wildlife conservation in Swaziland.

For a decade, Tampa’s Lowry Park Zoo has committed annual funds in support of the Swaziland conservation program which has helped to fund the acquisition of additional conservation land, equip anti-poaching programs and expand public education. Results to date include expansion of the Mkhuwaya Game Reserve by ten percent, which promotes the survival of elephants and thousands of other animals found in this protected area.

To learn more visit www.lowryparkzoo.com.
As simple as it might first sound, “animal welfare” is not easy to define. From studies of farm animals, as well as zoo and aquarium animals, welfare includes focus on both an animal’s physical health and its psychological well-being. Health is fairly straightforward – a healthy animal is one that is free of injuries or diseases. The concept of psychological well-being is more difficult to understand and assess because it involves us doing our best to understand an animal’s feelings and perceptions.

Ways that we assess psychological well-being include confirming an animal’s opportunities to make changes – if it’s hungry, it can seek food; if it’s sleepy, it can find a comfortable place to rest; if it’s scared, it can find a safe place to retreat. We also want to confirm that an animal has opportunities to exhibit species-typical behaviors like digging, dust-bathing, swimming, or nesting.

We provide for our animals’ physical and psychological needs through good exhibit design, comprehensive veterinary care, scientific studies, balanced diet, and through good husbandry, training, and enrichment. In a broader sense, we enhance welfare by taking collective ownership of good animal welfare (“welfare is everyone’s job”). In future issues of CONNECT, we will discuss roles of AZA committees as they relate to animal welfare and provide examples of what zoos and aquariums are doing to enhance welfare especially by using science to better understand animals in our care.

“ANIMAL WELFARE” VS. “ANIMAL RIGHTS” – WHAT’S THE DIFFERENCE?

“Animal rights” and “animal welfare” are sometimes used interchangeably. What’s the difference between these two concepts? People involved in animal welfare ensure high quality standards of care for animals under human care. Animal rights advocates are concerned with legal and ethical rights of animals supporting the notion that animals should have some rights or even the same rights as humans. Animal welfare advocates look to science to provide measures for assessing care standards and potential needs for improvement.

“Animal welfare” and “animal rights,” are complex philosophical concepts so it’s not surprising that the general public is often confused by these terms. In 2004, the AZA Animal Welfare Committee surveyed the general public to determine their understanding of the two terms. Most people who said they support animal “rights,” when questioned further, actually described support of animal welfare tenants – that animals under the care of humans should receive humane treatment.

IT’S AN ART AND A SCIENCE

Animal care staff play a critical role in caring for animals and assuring that they are experiencing good welfare. Keepers and aquarists have an uncanny ability to perceive and intuit the welfare of animals they care for. Their perceptions and assessments of the health and well-being of individual animals under their care are cornerstones to good welfare. Recent tools have been developed and validated that capture caretakers’ perceptions in systematic and retrievable ways. In an upcoming issue of CONNECT, we will provide descriptions of some of these welfare assessment tools (e.g., WelfareTrak). Stay tuned.
The animal welfare concepts that we apply in the zoo and aquarium realm have their roots in studies conducted with farm and lab animals. We’ve been able to build on results from studies on cattle, pigs, chickens, and gerbils, adapting them to ask and answer welfare questions about species living in zoos and aquariums. Collective scientific studies in both farm animals and zoo animals have demonstrated that there is no single measure of welfare, no single score. Welfare is based on physical, physiological, and psychological health and is therefore best measured in multiple ways.

It’s tempting to think that monitoring cortisol would allow us to measure stress in animals. We now know that elevated cortisol can be an indicator of stress, excitement, or interest. Alone, cortisol doesn’t tell an entire story about the welfare of an individual animal. However, in conjunction with other physiological and behavioral measures, we begin to get a better understanding of an individual animal’s welfare. There are several recently published examples of animal welfare studies that take this broader approach: polar bears, elephants, great apes, and program animals. In future issues, we will provide overviews of some of these studies.

**LET’S TALK ABOUT GOOD WELFARE**

There seems to be a lot of angst around discussions of animal welfare. Why is that? Does a focus on “animal welfare” imply a lack of welfare? Does a focus on welfare imply something is wrong and we need to fix it? Definitely no, but...

In a recent conversation with one of my co-workers, I said that I looked forward to talking to her about animal welfare. She replied, “Uh-oh.” I said, “Animal welfare isn’t bad. There’s good welfare and there’s poor welfare.” My co-worker said, “Yes, but you hardly ever want to talk about good welfare. When you say ‘welfare,’ it almost always means a problem with welfare.” Hmm. Point taken.

The study of animal welfare has focused mostly on animals in situations where welfare could be improved. Historically, we have had “low hanging fruit,” i.e., immediate and obvious situations where welfare of an individual is poor and we need to act immediately to improve that animal’s welfare. While it’s always critically important to remedy poor welfare, it’s equally important to identify and further enhance good welfare. Animal welfare scientists are increasingly looking for indicators of good welfare as much as for indicators of poor welfare.

What does good welfare look like? It varies by species and by individual. In mammals, some indicators of good welfare include higher rates of exploration, play, and in social animals increases in grooming and less aggression. Some physical signs may include glossy fur, healthy feathers or scales, good muscle tone. A focus on welfare does not imply that “something is wrong.” A focus on welfare instead demonstrates our commitment to always raising the bar, always challenging ourselves to enhance animal care, to minimize instances of poor welfare and constantly improve opportunities for good welfare. In our conversations with our colleagues, co-workers, and our visitors, let’s portray animal welfare as a focus of pride in doing a good job and always planning for providing even better welfare.

**JILL MELLEN is the Education & Science Director at Disney’s Animal Kingdom**

---

**SAVE THE DATE**

**2014 ANNUAL CONFERENCE**

**Orlando**

**September 12-18**
For many of us, our childhood was spent exploring an interest in animal care. Whether it was surgical procedures on an entire plush collection or identifying a “new” native species in our backyard, a passion for animals was central to our formative years. Now that we’re established in our professional careers, we have the opportunity – and responsibility – to ignite that spark in the next generation of animal care professionals. A zoo in the heart of the Midwest is helping to do just that.

For many of us, our childhood was spent exploring an interest in animal care. Whether it was surgical procedures on an entire plush collection or identifying a “new” native species in our backyard, a passion for animals was central to our formative years. Now that we’re established in our professional careers, we have the opportunity – and responsibility – to ignite that spark in the next generation of animal care professionals. A zoo in the heart of the Midwest is helping to do just that.

Wednesday and Friday mornings are a hub of activity at Sunset Zoo in Manhattan, Kan. Dr. James W. Carpenter, MS, DVM, Dipl ACZM, Professor of Zoological Medicine, and Dr. David Eshar, DVM, Dipl ABVP, Dipl ECZM, Assistant Professor of Zoological Medicine, at the Veterinary Health Center at Kansas State University (VHC), and their intern and team of talented students are on grounds providing medical care for the Zoo’s 200 plus animal residents. This highly skilled and specialized service has been a staple of Sunset Zoo’s excellence in animal care for decades.

“The level of veterinary care we provide our animals is one-of-a-kind, particularly for a Zoo of our size,” said Scott Shoemaker, Zoo director. “And the impact of our partnership also reaches the entire AZA community. We often joke about ‘Jim’s kids’ but in all seriousness, the training these students receive is the beginning to bright careers caring for animals in many of our institutions.”

Sunset Zoo’s partnership with the VHC began in 1933 with a passionate community member and University professor. Credited with founding Manhattan’s Zoo, Dr. E.J. Frick also served as the head of surgery and medicine at the VHC. In addition to preparing the next generation of animal health professionals, Dr. Frick dedicated over 40 years of service to acquire, care for and exhibit Sunset Zoo’s animal collection.

After 80 years, this partnership has blossomed into a unique relationship benefiting not only the Zoo’s animal collection but the students of Kansas State University and, ultimately, the Zoological Medicine career field.

“Our community is very fortunate; specialists in exotic medicine and highly-skilled students provide a great deal of care to the Zoo’s animals, while also creating an opportunity for our students to receive front-line clinical training in the field of zoological medicine right here in the heartland,” said Dr. Roger B. Fingland, executive associate dean and director of the Veterinary Health Center at Kansas State University.

Until recently, a majority of the veterinary care occurred on-grounds in a small, outdated clinic. Previously serving as the community’s animal shelter and part of the Zoo’s former administrative offices, the clinic met accreditation standards. While adequate, the
facility simply was not commensurate with the quality of Sunset Zoo, the skill of the clinicians and students providing animal care, or the commitment to Sunset Zoo by the local community.

However, in 2013 that all changed. Through the support of the VHC, Kansas State University Veterinary Clinical Outreach, Inc., the City of Manhattan and Sunset Zoo, as well as the Friends of Sunset Zoo, the Zoo’s veterinary clinic underwent a major facelift.

With the moving of the Zoo’s administrative offices to the newly opened entryway facility, the Nature Exploration Center, the clinic has now expanded into the emptied space, almost quadrupling the area dedicated to on-grounds animal health. The former space now serves as a main exam room and is outfitted with over $50,000 of modern medical equipment. Several additions directly enhance animal care including a surgery room, pharmacy and laboratory space, and three rooms dedicated to animal holding and recovery. Other renovations include the addition of a library and conference room, as well as dedicated space to manage animal medical records.

“Through these renovations, the quality of animal care and our clinical teaching is greatly enhanced and response times for medical emergencies reduced,” said Dr. Carpenter. “The new Clinic is the most exciting event that our Zoological Medicine Service has experienced in my 24 years overseeing veterinary care at Sunset Zoo. And while it is certainly a team effort, Dr. Fingland should be acknowledged as the visionary making it possible.”

The renovated clinic was recently unveiled and is named in honor of Dr. Carpenter. Dr. Carpenter’s vision and commitment to wildlife care began at the age of 10. He has dedicated his professional life to the wildlife, zoo and exotic animal community and is deeply respected by his peers.

Dr. Carpenter’s contributions to the veterinary profession are significant and include authoring over 180 scientific papers and being active in several editorial capacities including editor of the journal *Avian Medicine and Surgery*. He authored the *Exotic Animal Formulary*, a quick reference guide to the drugs and dosages used to treat exotic animals. Dr. Carpenter has received numerous honors including Exotic DVM of the Year and Avian Practitioner of the Year. He has served as president of the American Association of Zoo Veterinarians (AAZV) (1998-1999), president of the Association of Avian Veterinarians (2006-2007) and president of the American College of Zoological Medicine (2008-2009). In 2004, he was recognized by the AAZV with the Emil Dolensek Award for exceptional contributions to the conservation, care and understanding of zoo and free-ranging wildlife.

While certainly accomplished, Dr. Carpenter remains focused on developing the next generation of veterinarians. Each week, he guides interns and students through the ever-challenging process of providing an entire Zoo’s diverse animal collection with top-notch care.

Currently, there are only 28 colleges of veterinary medicine in the U.S. While all offer some coursework in exotic animal medicine, only 16 of the colleges have a dedicated zoological medicine program. Kansas State University is certainly among a dedicated few. Nestled in the heart of the Midwest, students often arrive with interests in domestic pets, cattle and horses. However, through Dr. Carpenter’s leadership, these students are receiving a once-in-a-life opportunity to care for endangered species from around the globe – experiences that result in stronger clinicians and ignite the next generation of zoological medicine professionals.
MESSAGE FROM THE CHAIR OF THE BOARD

Greetings AZA members and stakeholders,

Your Association is starting off the year with a diversity of noteworthy efforts focused on serving our membership and furthering our work related to saving species and engaging people. Here are updates on just a few.

What’s more appropriate to consider at the start of a new year than the cultivation of the future leaders of AZA-accredited zoos and aquariums? First, I want to call your attention to the AZA’s Professional Training Courses in Wheeling, W. Va. The next series of courses will be offered in February. These courses are taught by your fellow zoo and aquarium professionals and offer both excellent learning and networking opportunities. More information on these and other upcoming courses can be found on the AZA website.

Additionally, as part of the Professional Development program, the AZA is helping to ensure superb future leadership with a new Executive Leadership Development Program. The pilot program is launching this year, and includes a two-day course to be held in conjunction with the Directors’ Policy Conference, followed by web-based meetings and study exercises spread out over the two years of the program. Participants also are being assigned mentors from other AZA-accredited institutions.

Turning to work related to saving species and engaging people, AZA is moving forward to establish a Palm Oil Task Force to both develop AZA’s position on palm oil and to pull together the great resources on this topic that already have been developed by many of our members. Harvesting palm oil is a serious conservation issue, and the Board of Directors believes that this is a key opportunity for AZA members to engage visitors and other stakeholders on a critical species conservation issue.

In the area of government affairs, I wanted to be sure that you are aware that the AZA and a number of aquarium members are working to shape proposed federal rules to prevent the destructive practice of shark finning in U.S. waters. In particular, we want to make sure that the federal effort does not preempt or weaken the shark finning bans that already exist in a growing number of states. Momentum on shark finning continues to build. A resolution has been introduced in the House of Representatives, H. Res. 285, by Representative Vern Buchanan (R-FL-16), expressing the sense of the House of Representatives that the United States should ban and prevent the import of shark fins from sharks caught through the practice of finning, recognizes the threat shark finning poses to sharks, and condemns the practice worldwide. The resolution currently has 90 bipartisan cosponsors. We will keep you up-to-date on this legislation as it moves forward.

Finally, last month, I included in this column information on the ivory crush that took place in November. Working with AZA and other conservation organizations, the United States Fish and Wildlife Service destroyed six tons of illegal African elephant ivory that it had been stockpiling since the 1980s. The AZA is moving forward with plans for the material from the ivory crush as well as plans for how to help engage our zoo and aquarium guests in this issue. As a next step, the AZA staff will be putting together a design team that will include designers and educators to develop plans for the materials from the ivory crush, with input from a variety of stakeholders. Related to this, AZA Vice President for Federal Relations Steve Olson attended the Clinton Global Initiative meeting on wildlife trafficking last month, continuing to establish AZA as a key partner in this growing effort.

Here’s to a year during which we take to new heights our goal to inspire people to respect, value and conserve wildlife and wild places.

Jackie Ogden, PhD
Vice President, Animals, Science and Environment
Walt Disney Parks and Resorts
BIRTHS & HATCHINGS

RECENT BIRTHS AT GRANBY ZOO
A female snow leopard, named Indira, was born on 8 June 2013 at Granby Zoo, Québec. Snow leopard cubs, born at around 500 g (18 oz) with eyes closed, are vulnerable and rely entirely on their mother for the first three to four months. This is the fifth living offspring for our couple: Snowflake, an eight-year-old female and Makalu, a nine-year-old male. They respectively came from Assiniboine Park Zoo, Manitoba, in 2006 and Rolling Hills Wildlife Adventure, Kan., in 2005. Due to Makalu’s calm behavior and Snowflake’s strong maternal instinct, we decided to introduce the male back with the female and the cub in September. Unlike other felines, snow leopard males can usually coexist with their offspring without any complication.

On 1 July 2013, the Zoo’s six-year-old female red panda Kayah gave birth to one male and two females. Although it was her third pregnancy, it was the first time she had triplets and Kayah turned out to be an excellent mother. Since last spring, our red pandas are housed in a brand new exhibit especially created for them and it provides the appropriate conditions for mating and rearing babies. For two months, the babies were only visible on live cameras installed in the nest boxes. They started to come out on their own just in time for the Red Panda International Day celebrated at the Zoo on 21 September 2013, showing the visitors how curious and lively they are.

The Granby Zoo participates in the Species Survival Plan® (SSP) for both red pandas and snow leopards, two threatened species that have had breeding success at the Zoo in the past years. Both species live in the mountain habitats of Central Asia, and are listed on Appendix I of CITES.

SIGNIFICANT BONOBO BIRTHS AT THE MILWAUKEE COUNTY ZOO
The bonobo population recently increased to 18 with the birth of two females at the Milwaukee County Zoo in Milwaukee, Wisc. Thirteen-year-old Elikia gave birth on May 8 and 17-year-old Tamia gave birth on June 29. This was the second baby for Elikia and the first for Tamia. Both infants are nursing from their mothers and thriving. They are also being cared for by other bonobos.

There are an estimated 150 captive bonobos in Europe and North America combined, so each birth is significant to the overall population. Currently, the Milwaukee County Zoo has one of the largest captive bonobo collections.

These births also represent a significant conservation accomplishment for this endangered species whose numbers are dwindling in the wild due to habitat loss, illegal hunting, disease and pet trading.

CONTINUED, PAGE 34

© Zoo de Granby

© Milwaukee County Zoo

© Milwaukee County Zoo

© Zoo de Granby
BIRTHS & HATCHINGS

GIRAFFE CALF BORN AT GREAT PLAINS ZOO AND DELBRIDGE MUSEUM OF NATURAL HISTORY

The Great Plains Zoo and Delbridge Museum of Natural History in Sioux Falls, S.D., announced the birth of a reticulated giraffe calf in September. The Zoo’s four-year-old reticulated giraffe Solstice gave birth to her first calf, a male weighing 146 pounds and standing about six feet tall. The giraffe was able to give birth on her own, while the Zoo’s veterinary and animal care staff monitored the birth through a viewing window in the Giraffe Barn.

After a 15-month gestation, a giraffe gives birth standing up, and the calf drops more than five feet to the ground. The fall doesn’t hurt the calf; it just causes it to take a breath. After about an hour, the calf can stand up and walk.

“We are really excited about the birth of a giraffe calf at the Zoo this year,” said Elizabeth A. Whealy, president and CEO of the Great Plains Zoo.

BIRTHS AT WOODLAND PARK ZOO

Following a 15-month gestation, the tallest baby in Seattle was born in early August to Olivia, a six-year-old Rothschild’s giraffe. The male giraffe weighed in at 144 pounds and stood six feet tall at birth. The newborn calf stood within 90 minutes after birth and began nursing shortly after.

The birth marked the first viable birth of giraffes at the Zoo in 16 years and the first offspring for Olivia and the father, Chioke. Sadly, Chioke died in January of 2012.

Staff captured the birth and the calf’s struggle to stand on video. “We posted the video of the birth on YouTube and distributed it to the press. He became an overnight sensation through the press and on social media. Who knew the impact of a baby giraffe could stretch across the world,” remarked Martin Ramirez, a curator at Woodland Park Zoo.

Olivia arrived at Woodland Park in 2008 from Dickerson Park Zoo and her sister Tufani arrived in 2009 from Dickerson Park Zoo under a breeding recommendation made by the Giraffe Species Survival Plan® (SSP).

Triplet jaguars, two females and a male, were born in March of 2013 at Woodland Park Zoo to first-time parents, seven-year-old Nayla and 14-year-old father Junior. The last birth of jaguars at the Zoo was in 1994. The girls, named Arizona and Inka, and the boy, named Kuwan, made their public debut at three months of age.

The father arrived at Woodland Park Zoo in 2005 from Santa Cruz Zoo in Bolivia under a collaborative conservation program to help save the big cats from extinction and to enhance the captive gene pool in North America. The mother arrived in 2006 from Akron Zoo in Ohio under a breeding recommendation made by the Jaguar SSP. Since the father’s parents were wild-born and this is the first birth for both parents, the representation of their genes will be very significant for the Jaguar SSP.

The adult jaguars were first introduced in 2009. “Nayla gave birth last August to a stillborn, but it gave us hope she could carry a full-term pregnancy,” said Mark Myers, a curator at Woodland Park Zoo. “Thanks to the dedication and expertise among our animal care staff, coupled with the comfort level between Nayla and Junior, we’re very proud of the successful birth of these three healthy cubs.”

Since its creation in 2003, Woodland Park Zoo’s Jaguar Conservation Fund each year supports several field conservation projects dedicated to preserving wild jaguars and their habitat. The Fund has made awards to 33 projects in eight Central and South American countries for a total investment of $102,806. Currently, the Zoo supports three projects in Mexico, Guatemala, and Paraguay-Bolivia that all aim to reduce conflict between people and jaguars.

In May of 2013, Woodland Park Zoo introduced an adult pair of Asian small-clawed otters in its new exhibit, Bamboo Forest Reserve. This marked the first time the Zoo has displayed this species of otter. Six weeks later, zookeepers heard unusual, high-pitched squeals coming from the den and saw signs of a newly-made bamboo nest and protective parent-like instincts. The new pair delivered its first litter of pups.

The adults both arrived at Woodland Park Zoo earlier this year, the male from Zoo Atlanta and the female from Bronx Zoo.

Among this otter species, the father and any older siblings play an important role in raising the pups. “Since the pups were born, the four-year-old mom and eight-year-old dad never left their sides. Both did a great job of parenting. While mom nursed, the dad pitched in for support in the den,” said Pat Owen, a collection manager at the Zoo.

This species of otter ranges throughout southern and southeastern Asia, including areas of India, Indonesian islands, Malaysia, Southeast Asia, Taiwan, southern China and Palawan in the Philippines. Asian small-clawed otters spend more time on land than most otters. They use natural habitats of ponds and lakes, rivers and streams, coastal tide pools and estuaries, freshwater and mangrove swamps, and also human habitats, especially rice fields.

With rapidly declining habitat, range and population, the Asian small-clawed otter moved from near threatened status in 2004 to the more serious vulnerable category in 2008. The population in the wild is unknown, with some estimates at 5,000 and others at far fewer. While all otter species have protected status under Convention on International Trade in Endangered Species (CITES) and killing is prohibited in most range countries, enforcement remains very limited. Poaching and water pollution remain its highest threats.
RARE SWIFT FOX KITS BORN AT THE ENDEANCED WOLF CENTER

Four healthy swift fox (Vulpes velox) kits were born at the Endangered Wolf Center in St. Louis, Mo., on 8 May, 2013 to five-year-old female Peggy and four-year-old male Ernie. The parents were recommended to breed this year by the Swift Fox Species Survival Plan® (SSP). The kits are now out of the den and exploring their habitat.

“The parents are amazing and are doing a great job of taking care of the kits,” said Ginny Busch, executive director at the Center, “and a yearling from last year is also helping to raise the new kits as well.”

A true conservation success story, swift foxes had been eradicated in most areas of North America and were found in less than ten percent of their native habitat (at their lowest population level.) But the government and biologists, along with breeding facilities like the Endangered Wolf Center, worked together to rescue this species from extinction. Today, they are found in 40 percent of their original territory.

While their recovery has been successful to date, they are not out of the woods yet. The species is still considered endangered in Canada and is still absent in parts of their native range in the United States. In January of this year, a female fox named Kimi, who was born at the Endangered Wolf Center last year was flown to the Cochrane Ecological Institute in Canada to help with that country’s recovery efforts.

ENDANGERED GREVY’S ZEBRA BIRTH

An endangered Grevy’s zebra was born at Busch Gardens® Tampa’s, in Tampa Bay, Fla., 65-acre Serengeti Plain® on 5 August. Within an hour after its birth the baby was able to stand on its own and nurse from its mother Brooke.

Brooke is a 13-year old Grevy’s zebra and is welcoming her fifth foal. The new foal is the first offspring to father Two Step. The gestation period for Grevy’s zebras is 13 months and the mothers typically give birth to only one foal at a time. In addition to the new foal, seven female and one male Grevy’s zebras live on Busch Gardens’ Serengeti Plain®.

Busch Gardens’ guests can view the baby, parents and the rest of the zebra herd from the Edge of Africa, the Skyride or Serengeti Express train ride. For an even closer look, the Serengeti Safari offers guests an open-bed truck tour of the Serengeti Plain®, with opportunities to get up-close to antelope, rhinos, zebras and even hand-feed giraffes.

The population of Grevy’s zebra has declined by more than 50 percent in the last 18 years, and they are the only species of zebra that are listed as endangered by IUCN Red list, which is widely recognized as the most comprehensive, objective global approach for evaluating the conservation status of plant and animal species.
BIRTHS & HATCHINGS

Since 2007, the SeaWorld & Busch Gardens Conservation Fund has supported research and conservation of the Grevy’s zebra through a funding partnership with the Grevy’s Zebra Trust in Kenya. The Grevy’s Zebra Trust was established to address the urgent need to conserve Grevy’s zebra in the community rangelands of northern Kenya and southern Ethiopia by protecting and monitoring the zebra populations against poaching. Through this partnership, the Fund and the Trust are raising local awareness and developing a long-term community-led conservation program for Grevy’s zebra.

TWO SUMATRAN TIGER CUBS BORN AT THE SMITHSONIAN’S NATIONAL ZOO

Staff at the Smithsonian’s National Zoo in Washington, DC, are celebrating a conservation victory. The Zoo’s female Sumatran tiger, Damai, gave birth to two cubs on 5 August. The cubs appear healthy, and keepers have observed Damai grooming and nursing them.

“It’s taken more than two years of perseverance getting to know Damai and Kavi and letting them get to know each other so that we could reach this celebratory moment,” said Craig Saffoe. “All I can do is smile because the team has realized our goal of producing critically endangered tiger cubs. Damai came to us as a young tiger herself, so it’s really special to see her become a great mom.”

Keepers and veterinarians began monitoring Damai closely in June after she began gaining weight and exhibiting behaviors that indicated she could be pregnant. Staff trained Damai to participate in ultrasound procedures, which allowed them to confirm her pregnancy on 21 June. Keepers prepared for the arrival of cubs after Damai became restless and began showing signs that she would soon give birth. This is Damai’s first litter of cubs, sired by the Zoo’s 12-year-old male tiger, Kavi. The two bred several times from December 2012 through mid-April of this year.

Damai arrived at the Zoo in April 2011 from the San Diego ZooWild Animal Park in San Diego, Calif., and Kavi arrived one year ago from Zoo Atlanta in Atlanta, Ga. The Zoo received a recommendation to breed the two from the Sumatran Tiger Species Survival Plan® (SSP). They were introduced to each other slowly over the course of six months. At first they could see and smell each other but not touch each other. Keepers decided to give Kavi and Damai the opportunity to spend time together in the same indoor enclosure after many months of visual introductions.

Sumatran tigers are listed as critically endangered by the International Union for Conservation of Nature (IUCN). It is estimated that between 400 and 500 exist in the wild. There are 65 Sumatran tigers living in accredited zoos in North America in addition to these cubs.

MALE RED PANDA TWINS BORN AT DETROIT ZOO

The Detroit Zoo in Detroit, Mich., is celebrating the arrival of male red panda twins born in late June to eight-year-old Ta-Shi. The father, four-year-old Shifu, came to the Zoo in 2012 with a breeding recommendation from the Species Survival Plan® (SSP).

The twins’ birth marks the first time the pair have produced offspring and the fifth time Ta-Shi has given birth since her arrival at the Detroit Zoo in 2008.

“Ta-Shi is an experienced and attentive mom and very protective of her babies,” said Robert Lessnau, Detroit Zoological Society curator of mammals. “We’re thrilled to once again add to the captive population of this threatened species.”

Found in the mountainous regions of Nepal, Myanmar and central China, red pandas are classified as “vulnerable” on the International Union for Conservation of Nature’s (IUCN) Red List of Threatened Species due to deforestation.

The red panda (Ailurus fulgens) is a shy and solitary animal, except when mating. Contrary to popular belief, it is not a bear but rather belongs to its own taxonomic family. It is about the size of a house cat, with rust-colored fur and an 18-inch white-ringed tail. Red pandas are skilled and agile climbers, spending most of their time hanging from tree branches or lounging on limbs. They are most active in the early morning and evening hours.
SECONd ANGOLAN COLOBUS MONKEY BORN AT LAKE SUPERIOR ZOO

A female baby Angolan colobus was born at the Lake Superior Zoo in Duluth, Minn., on 16 July. This is the second birth since the Association of Zoos and Aquariums (AZA) Angolan Colobus Species Survival Plan® (SSP) breeding recommendation. The baby is the offspring of Kero, an 11-year-old female and Kramer, a 18-year-old male.

According to Director of Zoo Operations Peter Pruett these are significant births for AZA facilities since the Angolan colobus captive population is aging with limited births in the past few years. The two offspring are the 5th and 6th born in 2013. “It’s always great to see cute fun babies at the Zoo. However it’s especially rewarding when they are part of AZA’s effort to preserve captive and wild populations” said Pruett.

Angolan colobus are found in the Eastern region and Congo Basin areas of Africa. Their populations are considered stable with localized pressure from habitat destruction and the bush meat trade. Infants are born all white and weigh approximately one pound. After three months of age they begin transitioning to their adult coat, consisting of mainly long black fur with long white fur surrounding the face, trimming the tops of the shoulders and very tip of the tail.

OCeLOT BORN AT CAMERON PARK ZOO

Cameron Park Zoo in Waco, Texas, announced the birth of a baby ocelot kitten. The kitten, a male named Aztec, is the first infant born to Cameron Park Zoo ocelots, Maya and Gustavo. Maya is 14 years old, an age which is considered somewhat past the prime age for successfully producing offspring in ocelots. Ocelots reach sexual maturity at two-to-two and a half years of age and their life expectancy is seven-to-ten years in the wild and up to 20 years in captivity.

In November of 2012 Cameron Park Zoo welcomed a team of veterinary specialists from the Center for Conservation and Research for Endangered Wildlife (CREW), a division of the Cincinnati Zoo and Botanical Garden, in Cincinnati, Ohio, that performed a reproductive assessment on Maya. Even though she was past what would be considered her breeding prime, Maya was still cycling and the assessment showed that there could be a slight chance of a successful pregnancy, the team, along with Cameron Park Zoo veterinarian, Terry Hurst, collected semen from the male ocelot, Gustavo, and performed an AI procedure on Maya using a new laparoscopic oviductal AI technique. Unfortunately the AI procedure was not successful, and the assumption was that because of her age and the condition of her ovaries, Maya would not be able to be impregnated.

On 31 May 2013 Maya’s keeper, John Abernathy, kept her inside for the day because she had been observed regurgitating that morning. Later that morning Zoo staff members were surprised and excited to find a baby ocelot had just been born when they entered the ocelot night house at 11:00 am. Maya was given a nest box and hay for bedding her infant and then left alone to allow her time to bond. Keepers checked back at intervals throughout the next 36 hours to insure that Maya and the infant were well and that the infant was nursing. Apparently, Gustavo and Maya had their baby “the old fashioned way” and Maya has proven to be a healthy and attentive mother.
GORILLA FOREST OPENS AT COMO PARK ZOO

Como Park Zoo and Conservatory in Saint Paul, Minn., announced the official opening for Gorilla Forest. This $11 million exhibit redesign and overhaul features seven gorillas, six of whom are new to Como Zoo, and the largest all-mesh gorilla enclosure in North America.

The Gorilla Forest construction includes the addition of a major outdoor exhibit and significant improvements and expansions to the existing indoor facilities. All changes to the exhibit exceed the Association of Zoos and Aquariums (AZA) and the United States Department of Agriculture (USDA) requirements for holding, exhibiting and managing great apes. The 13,000 square foot outdoor space, almost three times larger than the previous space, was designed to give the gorillas ample room to play, climb, forage and display their extraordinary family and social dynamics to the public while minimizing stress on the gorillas and creating up close and personal views of the gorillas for visitors.

The improvements to the indoor facilities, including the behind-the-scenes areas, were enlarged and could make mating these endangered species a possibility for Como. The new gorilla holding building provides plenty of natural light and two stories for the animals with view windows and perches so the gorillas can see out. Improvements to existing rockwork and trees will provide more horizontal space for gorillas and planned family groups. Better ventilation, lighting, drainage and a new rainforest mural on the dayroom wall will create an improved environment for the animals and viewing experience for the public.

CINCINNATI ZOO’S JUNGLE TRAILS REINTERPRETED TO ENGAGE FAMILIES

Research shows that the main motivation of people who come to zoos is to have quality time with their families. At the Cincinnati Zoo & Botanical Garden in Cincinnati, Ohio, the Zoo has placed a strategic focus on becoming more visitor-focused, with a commitment to better understanding their needs in a free-choice learning environment. This includes tailoring interpretive exhibits to engage families, the Zoo’s primary audience.

Made possible with funding from a Museums for America grant from the Institute of Museum and Library Services (IMLS), the Zoo recently underwent a two-year process of research, development and design, and evaluation to re-interpret its Jungle Trails exhibit with a focus on active family engagement.
In *Jungle Trails*, guests journey along a path that winds through nearly two acres of jungle-type landscape, featuring African and Asian primates, including Sumatran orangutans, gibbons, and bonobos. As they learn how primates survive in the jungle, all new interpretive signage and interactives encourage guests to wonder what it would be like if their family lived in the forest.

Interactives present group challenges that our non-human primate relatives face every day. Together with their troop, guests use sticks to push a stone through a maze, test their memories to find fruit in a matching game, bang out a troop rhythm on a buttress root, and compete to see who is best at tying shoes without using their thumbs. They also try out more physical skills such as swinging across bars like a gibbon and balancing like a lemur on a mini-ropes course.

Colorful and playful signage introduces guests to the animals from the first-person perspective of the animal and prompts discussion of how the animal’s life compares to their own. Interactive iPad kiosks at the orangutan, gibbon and bonobo exhibits allow them to engage more deeply. Guests may choose to watch videos on taking care of the animals, read about the individual animals’ personalities, learn how they can help save the species or build a super primate of their own.
ANNOUNCEMENTS

2013 CONSERVATION ENDOWMENT FUND (CEF)

Thanks to all our donors!

The AZA Board of Directors and staff gratefully acknowledge the generosity of the following AZA members and institutions, commercial members and friends who have contributed to the AZA Conservation Endowment Fund between October 1, 2012 and September 30, 2013. We thank them for their support and commitment to saving the wonders of the natural world.

$10,000 AND ABOVE
Annual Conference Auction, Kansas City
Disney Worldwide Conservation Fund
Shark Reef at Mandalay Bay Travelodge

$5,000 TO $9,999
Applewood Fund at Community Foundation of Santa Cruz County

$2,000 TO $4,999
Abaxis
Lou Dorfman
PGAV Destinations
San Antonio Zoological Society Robert Skrable, Jr.

$1,000 TO $1,999
Cleveland Metroparks Zoo and Cleveland Zoological Society Ellen Trout Zoo
Fossil Rim Wildlife Center
Little Rock Zoo
Los Angeles Zoo and Botanical Gardens
Jim Maddy
Oklahoma City Zoo and Botanical Gardens
San Francisco Zoological Gardens
Sedgwick County Zoo
Virginia Aquarium & Marine Science Center Foundation
Utah’s Hogle Zoo
Wildlife Conservation Society
Wildlife World Zoo
Zoo Advisors
Zoo New England (Walter D. Stone Memorial Zoo and Franklin Park Zoo)

$500 TO $999
ABQ BioPark / New Mexico BioPark Society
Dr. Anne Baker
Ted Beattie in memory of Penny Beattie
Blank Park Zoo
Cameron Park Zoological Society Clyde Peeling’s Reptiland
Dakota Zoo
Dallas World Aquarium
David Traylor Zoo of Emporia Catherine Decker
Walt Disney Company Foundation Matching Gift
Emporia Friends of the Zoo
The Florida Aquarium
Jean Cecil and William R. Foster
Greater Minot Zoological Society
Lahser Interspecies Research Foundation
North Carolina Zoological Society
Jackie Ogden, PhD
Peoria Zoological Society
Potawatomi Zoological Society
Roger Williams Park Zoo
Pat Simmons, Akron Zoo
Tom Stalf
Troy Stump, ZOOAMERICA Wildlife Park
Texas State Aquarium
Tulsa Zoo
The Utica Zoo
Emily Wade
Zoo de Granby

Rich Block
Bruce Bohmke
Paul Boyle, Ph.D. and Bonnie Boyle
Brevard Zoo
Charles Brady, PhD
William P. Braker
Bravo Packing
Anthony (Tony) Budrovich
Patrick M. Burchfield
Dr. Bruce Carlson and Marjorie Awai
Bert and Janice Castro
Cawley Company
Children’s Zoo at Celebration Square
Chattanooga Zoo
Classic Escapes Inc.
Connie Cloak
Catherine Decker
JoEllen Doornbos
Lee Ehmke, Director/CEO
Thomas DeMaar, DVM
Troy Stump, ZOOAMERICA Wildlife Park

$200 TO $499
Jim Anderson
Ed Asper
Rick Barongi
Scott Barnett
Best Family Fund
Tammie Bettinger and Joe Bielitzki
Kevin Bell

Deb Kerr and Steve Thompson
Satch and Becky Krantz
Robert Lacy
Jeff Lamoree, Sequoia Park Zoo
Lion Country Safari, Inc.
Lubee Bat Conservancy
Sandy and Jerry Manne
Maryland Zoo in Baltimore
Mark J. Mazz, A.L.A.
McRoberts Sales Co., Inc.
Dr. Kay Mehren
Miles River Direct
Fran Miglore
Staff of Mill Mountain Zoo
R. Eric Miller
M & M Giftshows, LLC
Dr. Murray A. Newman
The Oklahoma Zoological Society, Inc.
Harry Papp
Tom Phillips
Potter Park Zoological Society
Barbara and Kris Pueschel
Mark and Mary Reed
RodentPro.com, LLC
Kim and Danny Sams
Paula Schaedlich
Susan Scherer, Board Member, Columbus Zoo and Aquarium
Kim and Tom Schmid
Schultz & Williams
Seneca Park Zoo
Scott Shoemaker, Director, Sunset Zoo
Pat Simmons in honor of Peter Karsten
Beth Stevens
Tautphaus Park Zoo
Steve Taylor
Tennessee Aquarium
Topeka Zoological Park
Tracy Aviary
Kristin L. Vehrs
Jay and Eileen Vestal
Virginia Zoo
Over the past year, members of the Field Conservation Committee (FCC) again reached out to fellow Association of Zoos and Aquariums (AZA)-accredited members to encourage submission to AZA's Annual Report on Conservation Science (ARCS). FCC has recognized that this survey is the only way that the Association of Zoos and Aquariums (AZA) can accurately describe the conservation activities of the zoological community as a whole, and understanding the scope of activity is critical for telling our story.

With each survey since 2011, when the FCC introduced a definition of field conservation specific to the AZA community focused on activities with a direct impact on the wild, AZA members have been increasingly careful in their submissions to ARCS. Each year, less review and discussion among FCC members is necessary to ensure that all submissions meet the definition's criteria, and many facilities are submitting their data more promptly. With the introduction of AZA's new online database, My AZA, in 2013 and the ability for members to input, review, and edit their submissions at any time during the year, responding to the annual survey should become easier each year.

We are pleased to report that field conservation expenditures held steady at approximately $160 million for the past two years, based on a 78 percent survey response rate in 2012. Imagine how the amount of money might grow if the response rate were higher. In 2012, 43 member facilities dedicated more than three percent of their annual budget to field conservation, up from 36 in 2011. There are still too many facilities contributing less than one percent of their budgets to conservation; the FCC would welcome hearing from those colleagues to learn more about the obstacles they are facing and to help identify ways to overcome those and other obstacles in the future.

We are currently in the midst of collecting information about field conservation activities that took place in 2013. Although only one person per facility may submit the information to the online database, anybody with an AZA account may log into the website to see which projects their facility has entered (log into your account at www.aza.org and click the “conservation” link in the left-hand menu). Make sure that your critical work is being counted, and if you do not know who is responsible for submitting project information at your facility or you have questions about using the online database, contact Shelly Grow (sgrow@aza.org).

Thank you for participating in the survey and feel free to contact any FCC member with ideas on how the Committee can be of help to you.
CELEBRATING 30 YEARS
Evolutionary Thinking in Habitats

Madewell Products Corporation
7561 Industrial Court, Alpharetta, GA 30004
PHONE (800) 741-8199 • (770) 475-8199 • FAX (770) 475-8167
www.madewell.net • sales@madewell.net

Aquarium Lining Systems
• Durable
• Fade Resistant
• Prevent Leaks
• Easy to Clean

Proudly manufactured in the USA by
"The Name Says It All"
MEMBER UPDATES

WELCOME NEW MEMBERS

AZA is pleased to warmly welcome new Professional Affiliate, Professional Fellow, Conservation Partners, Accredited Institutions, Certified Related Facilities and Commercial members.

NEW PROFESSIONAL AFFILIATE MEMBERS

Cristy Barrett, Senior Bio, The Florida Aquarium
Zabrina Esperanza Boman, Zoo Keeper, San Diego Zoo
Brian Braitsch, SeaWorld Orlando
Tangera Cross, Curator of Animal Health, Knoxville Zoological Gardens
Donna Evernham, Assistant Curator, Brandywine Zoo
Alicia Fields, Lead Park Ranger, Phoenix Zoo
Holly Haefele, DVM, Director Animal Health, Fossil Run Wildlife Center
Lydia Meriel Hopper, Research Scientist, Lincoln Park Zoo
Phillip Horvey, Senior Keeper of Birds, Sedgwick County Zoo
Mara Jameson, Zookeeper, Reid Park Zoo
Sarah Johnson, Busch Gardens Tampa Bay
Kathryn Kisner, The Florida Aquarium
Brian Manfre, Mammal Dept Supervisor, Detroit Zoo
Shannon Nicole Morarity, Assistant Curator – Australia and the Islands, Columbus Zoo and Aquarium
Sarah Pechtel, Potter Park Zoological Gardens
Chris Pointer, Lead Park Ranger, Phoenix Zoo
Nicolaas VanVacter Webb, Keeper, San Diego Zoo
Jean Whalen, Assistant Director – Parks, Cape May County Park Zoo
Jacque Williamson, Curator of Education, Brandywine Zoo
Carman Wirtz, Vice President of Human Resources, Columbus Zoo and Aquarium

NEW PROFESSIONAL FELLOW MEMBERS

Alison Prange, Executive Director, Friends of the Zoo, Henry Vilas Zoo
Malia Somerville, General Curator, Buffalo Zoo

NEW CONSERVATION PARTNER

ABES 2000 Ltd
3433 Mary Anne Crescent
Victoria, BC V9C 4K
CANADA
Email: patti_s@abes.ca
www.abes.ca
Director: Mitchell McCormick

BUY BULK “QUARTER” TOKENS FOR Conservation

Your Vote Can Make A Difference!

• Stock or Custom
• Reusable
• Recyclable

TokensDirect.com
877-480-0458

Station Photo Courtesy of Denver Zoo (303) 258-3583
Upgrade to a Better Bug!

- Naturally high in calcium - over 10x more than crickets
- Balanced Ca:P ratio
- Low in fat
- No dusting needed
- No noise, no mess low odor
- Won’t cause impaction
- Optimum nutrition & growth
- Strengthens immune system
- Available in four sizes

Eurofins: ANALYSIS INFO:
- Protein 15.71 %
- Ash 2.34 %
- Calories Calculated: 153 kcal/100 g
- Carbohydrates: Calculated 4.40 %
- Calcium 0.43 %
- Phosphorus 0.30 %
- Crude Fat By Acid Hydrolysis 8.09 %
- Moisture By Vacuum Oven 69.46 %

Ca:P ratio 1.43 to 1

www.reptiworms.info
530-342-3699 voice
866-515-3470 fax
reptiworms@gmail.com
## INDEX OF ADVERTISERS

<table>
<thead>
<tr>
<th>Company</th>
<th>Website</th>
<th>Phone</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Sealants, Inc.</td>
<td><a href="http://www.amsealinc.com">www.amsealinc.com</a></td>
<td>970-523-6001</td>
<td>48</td>
</tr>
<tr>
<td>Animal Specialties</td>
<td><a href="http://www.animalspecialties.com">www.animalspecialties.com</a></td>
<td>800-782-3766</td>
<td>44</td>
</tr>
<tr>
<td>Aqua Logic Inc.</td>
<td><a href="http://www.aqualogicinc.com">www.aqualogicinc.com</a></td>
<td>858-292-4773</td>
<td>46</td>
</tr>
<tr>
<td>CLR Design</td>
<td><a href="http://www.clrdesign.com">www.clrdesign.com</a></td>
<td>215-564-0250</td>
<td>42</td>
</tr>
<tr>
<td>Corners Limited</td>
<td><a href="http://www.cornerslimited.com">www.cornerslimited.com</a></td>
<td>800-456-6780</td>
<td>10</td>
</tr>
<tr>
<td>COST of Wisconsin, Inc.</td>
<td><a href="http://www.costofwisconsin.com">www.costofwisconsin.com</a></td>
<td>800-221-7625</td>
<td>17</td>
</tr>
<tr>
<td>Creative Displays, Inc.</td>
<td><a href="http://www.creativedisplays.com">www.creativedisplays.com</a></td>
<td>800-733-9617</td>
<td>31</td>
</tr>
<tr>
<td>Dan Inject Dart Guns</td>
<td><a href="http://www.daninjectdartguns.com">www.daninjectdartguns.com</a></td>
<td>979-203-6735</td>
<td>23</td>
</tr>
<tr>
<td>Detroit Zoological Society</td>
<td><a href="http://www.detroitzoo.org">www.detroitzoo.org</a></td>
<td>248-541-5717</td>
<td>36</td>
</tr>
<tr>
<td>GLMV Architecture, Inc.</td>
<td><a href="http://www.glmv.com">www.glmv.com</a></td>
<td>316-265-9367</td>
<td>38</td>
</tr>
<tr>
<td>Go Ape</td>
<td><a href="http://www.goape.com">www.goape.com</a></td>
<td>800-971-8271</td>
<td>15</td>
</tr>
<tr>
<td>K &amp; K Insurance Group, Inc.</td>
<td><a href="http://www.kandkinsurance.com">www.kandkinsurance.com</a></td>
<td>877-355-0315</td>
<td>11</td>
</tr>
<tr>
<td>Madewell Products Corporation</td>
<td><a href="http://www.madewell.net">www.madewell.net</a></td>
<td>800-741-8199</td>
<td>42</td>
</tr>
<tr>
<td>The Mason Company</td>
<td><a href="http://www.masonco.com">www.masonco.com</a></td>
<td>800-543-5567</td>
<td>6</td>
</tr>
<tr>
<td>Milliken Meat Products Ltd.</td>
<td><a href="http://www.millikenmeat.com">www.millikenmeat.com</a></td>
<td>905-415-0060</td>
<td>25</td>
</tr>
<tr>
<td>Nebraska Brand</td>
<td><a href="http://www.nebraskabrand.com">www.nebraskabrand.com</a></td>
<td>800-445-2881</td>
<td>Back Cover</td>
</tr>
<tr>
<td>RodentPro.com</td>
<td><a href="http://www.rodentpro.com">www.rodentpro.com</a></td>
<td>812-867-7598</td>
<td>Inside Back Cover</td>
</tr>
<tr>
<td>Tom Tischler Bronze</td>
<td><a href="http://www.tomtischler.com">www.tomtischler.com</a></td>
<td>618-936-42702</td>
<td>7</td>
</tr>
<tr>
<td>The University of Chicago Press</td>
<td><a href="http://www.press.uchicago.edu">www.press.uchicago.edu</a></td>
<td>773-702-7897</td>
<td>41</td>
</tr>
<tr>
<td>WDM Architects P.A.</td>
<td><a href="http://www.wdarchitects.com">www.wdarchitects.com</a></td>
<td>316-262-4700</td>
<td>11</td>
</tr>
</tbody>
</table>
TITANIUM WATER CHILLERS
AND HEAT PUMPS
SINCE 1989

- Delta Star® and Cyclone® Chillers
- Multi Temp Water Chillers and Titan Heat Pumps
- Titanium Tube Sheet and Plate Heat Exchangers
- Temperature Controlled Tank Systems
- Skid Mount LSS packages
- Insulated PVC/ABS Tanks and Sumps
- Custom Plastic and Metal Fabrication
- UV Sterilizers, Pumps and so much more

Products that perform when precision counts.

Call the industry source today and experience the benefit of American made products, ingenuity and value.

8268 Clairemont Mesa Blvd., Suite 302, San Diego, CA 92111  T: 858.292.4773  F: 858.279.0537
Visit us at: aqualogicinc.com and aquaneticsparts.com
FEBRUARY 2014

3-8: Avian Management, Biology, and Conservation. Hosted by Oglebay Resort in Wheeling, WV. Avian Management, Biology and Conservation will enhance your effectiveness as a bird keeper and avian program leader. A major goal of the class is to teach critical thinking techniques that lead to informed decisions regarding the future of avian collections. Students will be given a variety of tools, techniques and best practices to provide a foundation for understanding and meeting current challenges in avian management. For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training

3-8: Conservation Education: Effective Program Design. Hosted by Oglebay Resort in Wheeling, WV. Conservation Education: Effective Program Design provides zoo and aquarium educators with a comprehensive overview of how to design, develop, implement and evaluate education programs and exhibit interpretive elements. Course materials include the latest research and trends in informal science education. For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training

3-8: Institutional Records Keeping. Hosted by Oglebay Resort in Wheeling, WV. Institutional Records Keeping offers students the theory and mechanics of animal records-keeping and identifies the important role accurate records play in successful animal management not only within the institution but also in regional and global cooperative species management programs. This course offers students training that will integrate best practices for accurate data entry and standardization of data along with technical instruction. This instruction is in the most updated application of ISZ (International Zoo Veterinary System – ZIMS 2013) which will be deployed in early 2013. This course provides students exposure to the most current technology that defines the future of animal records keeping. For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training

3-8: Managing for Success: Career Development. Hosted by Oglebay Resort in Wheeling, WV. Managing for Success: Career Development examines management disciplines with emphasis on their application to zoos and aquariums. Participants will receive practical tools and skills to take back to their institutions to apply at their level, including an increased network of resources and heightened leadership skills. For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training

3-8: Managing for Success: Organizational Development. Hosted by Oglebay Resort in Wheeling, WV. Managing for Success: Organizational Development prepares new leaders to meet the specific challenges of a leadership role within a zoo or aquarium and the duality of meeting both mission and bottom line. The course addresses ethical, animal welfare and collection issues as well as the planning techniques and strategies required to lead these unique organizations successfully. For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training

3-8: Principles of Elephant Management I. Hosted by Oglebay Resort in Wheeling, WV. Principles in Elephant Management I focuses on the foundation necessary for developing comprehensive and proactive elephant management programs. Students will take away skills for creating self-sustaining elephant management programs. AZA Accreditation Standards require that at all elephant care professionals (keepers, managers, and directors) at institutions keeping elephants attend this course. For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training

MARCH 2014

10-13: AZVT (Association Zoo Veterinary Technicians) Focus Group: The Art and Science of Hand-Rearing is scheduled for March 10-13, 2014 hosted by Safari West Nature Preserve (www.safariwest.com) in Santa Rosa, California, USA. The workshop concentrates solely on hand-rearing of zoo carnivore and ungulate species. The organizing committee is working with experts in the field to present exciting new and proven hand-rearing information to zoo veterinary and zoo animal care staff involved in this specialty. We are seeking a RACE approved CE for zoo veterinary staff.

An optional pre-workshop training session on March 10, 2014 is scheduled with Dr. E. S. Dierenfeld PhD, CNS to learn about ZootritionTM the dietary management software. For details contact Gail Hedberg, AZVT Workshop Program Coordinator at ghedberg@safariwest.com.

15-19: Hosted by the Downtown Aquarium and Denver Zoo. The 2014 Otter Keeper Workshop (OKWS) is a comprehensive four-day workshop covering the care and management of otters in captivity. The workshop will be devoted to four of the species managed in Association of Zoos and Aquariums (AZA) facilities: African spotted-necked otters, Asian small-clawed otters, giant otters, and North American river otters. 2014 will be the sixth offering of the OKWS. The hosts will be the Downtown Aquarium and Denver Zoo. The ultimate goal is to have an OKWS-trained staff person in each of the AZA otter holding institutions. For more information, contact David Hamilton at ahamilton@monroe county.gov.

22-28: AZA’s 2014 Mid-Year Meeting is being hosted by the Memphis Zoo in Memphis, Tenn. For more information, visit www.aza.org/midyearmeeting.
ini, the world’s largest species of octopus. The Seattle Aquarium has a long history of exhibiting octopuses—and giant Pacific octopuses are even found in the waters directly below our pier. The workshop will feature several papers and round-table discussions about octopus husbandry, biology, physiology, ecology and behavior. To speak contact Shawn Larson at slarson@seattleaquarium.org. To register, visit our website at seattleaquarium.org/octopus-workshop.

MARCH-APRIL 2014

March 27 - April 3: Crocodilian Biology & Captive Management. Hosted by St. Augustine Alligator Farm Zoological Park in St. Augustine, FL. Crocodilian Biology and Captive Management concentrates on the captive maintenance techniques, husbandry, breeding, and special requirements for the care of crocodiles, caimans, gharials, and alligators in zoos and aquariums. Relevant topics on basic crocodilian biology such as taxonomy, reproductive biology, behavior, anatomy, physiology, and conservation are included as the foundation for captive management practices. Join us at the only facility that houses all existing species of crocodilians and learn from the experts! For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training.

APRIL 2014

6-11: Animal Training Applications in Zoo & Aquarium Settings. Hosted by Disney’s Animal Kingdom in Orlando, FL. Animal Training Applications provides zoo and aquarium staff with a background in training theory and an understanding of the skills necessary to train animals. It includes a historical perspective of animal training as well as terminology and an overview of training techniques. Selected training concepts and skills will be taught via animal demonstrations, group activities and individual skill development opportunities. For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training.

MAY 2014

12-15: Principles of Elephant Management II. Hosted by Disney’s Animal Kingdom in Orlando, FL. Principles of Elephant Management II focuses on the skills necessary to safely accomplish all of the AZA-required elephant behavioral components. Live training demonstrations and hands-on experiences will be utilized to combine the teaching of advanced elephant principles with best occupational safety practices. To provide students with the most valuable hands-on and personalized experience, enrollment in this course is limited to 12 participants. For more information about this course and other opportunities to enrich your career, visit www.aza.org/professional-training.

SEPTEMBER 2014

12-18: The 2014 AZA Annual Conference is being hosted by Disney’s Animal Kingdom, The Seas With Nemo and Friends, and SeaWorld Orlando. This is the premier event for zoo and aquarium professionals, bringing together leaders in our community to network with peers, explore ideas and best practices, share successful programs, and learn new technologies and services. Attendees are guaranteed to be challenged with vibrant speakers from inside and outside the community, expert-led programming, face-to-face meetings with colleagues, more than 150 service providers in the exhibit hall, exciting networking and social events, and the famous Zoo Day. For more information, visit www.aza.org/annualconference.
Order online!
www.RodentPro.com
It’s quick, convenient and guaranteed!

Discover what tens of thousands of customers—including commercial reptile breeding facilities, veterinarians, and some of our country’s most respected zoos and aquariums—have already learned: with RodentPro.com®, you get quality AND value! Guaranteed.

RodentPro.com® offers only the highest quality frozen mice, rats, rabbits, guinea pigs, chicks and quail at prices that are MORE than competitive. We set the industry standards by offering unsurpassed quality, breeder direct pricing and year-round availability.

With RodentPro.com®, you’ll know you’re getting exactly what you order: clean nutritious feeders with exact sizing and superior quality. And with our exclusive shipping methods, your order arrives frozen, not thawed.

We guarantee it.
www.RodentPro.com
P.O. Box 118
Inglesfield, IN 47618-9998
Tel: 812.867.7598
Fax: 812.867.6058
E-mail: info@rodentpro.com

@2007 Rodentpro.com, Inc.

Bottoms Up.
FORWARDING SERVICE REQUESTED

MOVING? SEND OLD LABEL
AND NEW ADDRESS

DATED MATERIAL
MUST BE RECEIVED BY THE 10TH