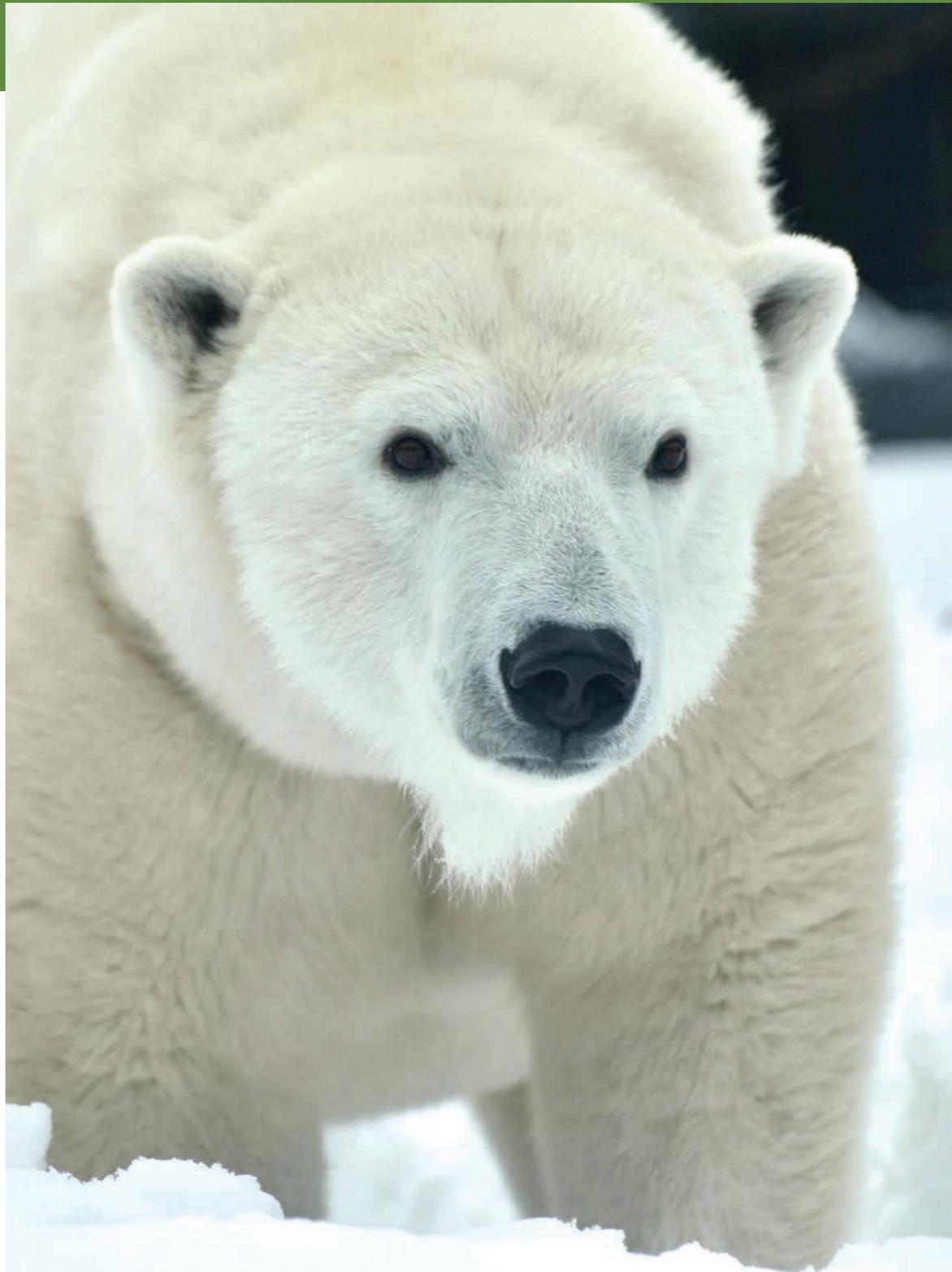




# MARYLAND ZOO

2016-2017 ANNUAL REPORT



# our mission

engaging people with the wonder of the living world  
through personal encounters that  
foster lifelong harmonious relationships with nature

This was an extraordinary year for The Maryland Zoo in Baltimore. For the first time in nearly 20 years, more than half a million guests visited the Zoo. They came in record-breaking numbers for perennially popular events and public programs such as Brew at the Zoo and Zoo Snooze Overnights. They also came in steady droves to enjoy time with extraordinary animals. Who wouldn't rush to the Zoo to visit a baby giraffe, two grizzly bear cubs, or a strapping young southern white rhinoceros?

These newcomers joined a collection that already includes more than 1,500 exotic and domestic animals native to distant savannahs, nearby streams, and every conceivable habitat in between. The Zoo is a place that celebrates biodiversity and caters to it in countless ways every single day. From orchestrating Wild About days to prepping diets of pinhead-size crustaceans, Zoo staff is dedicated to providing every guest with the best possible experience and every animal with the best possible care.

This annual report catalogues the work of the Zoo over a 12-month period from July 1, 2016 through June 30, 2017. During that time, 505,723 guests visited the Zoo and more than 14,000 member families supported the Zoo.



**HUGO J. WARNS III**

CHAIRMAN OF THE BOARD OF TRUSTEES

### *Letter from the Chairman*

In a recent lunchtime lecture with Zoo staff, Dr. Kate Evans, the founder of Botswana-based Elephants for Africa, noted that zoos have an especially important role to play in wildlife conservation because of the fact that they engage thousands upon thousands of people each year. All successful wildlife conservation hinges on education, she said, and education begins with engagement.

This message is particularly heartening to me because I believe strongly in the Zoo's dual mission of education and conservation and I know that, as an institution, we are better positioned than ever to fulfill our mission. This past fiscal year – for the first time in nearly 20 years – we had more than half a million visitors to the Zoo! I have no doubt that each one encountered amazing animals, had opportunity to engage in conversation with Zoo staff or volunteers, and left with new thoughts or feelings about wildlife in our world.

As I complete my tenure as Chair of the Zoo's Board of Trustees, I continue to remark on the professionalism and passion that each person in the organization delivers. They insure the highest level of care for the animals, an enduring commitment to the Zoo's mission, and a guarantee that each visitor will have the best possible experience while on grounds. I am proud to be associated with such a committed group of staff and volunteers.

I am equally impressed with the men and women who have served alongside me on the Zoo's Board of Trustees. They are committed to the Zoo and its future, and I know that they will continue to channel their own passion and professionalism in support of this great community asset.

I remain grateful as well to the City, the State, and the citizens and leaders of Baltimore, Carroll and Howard Counties for their continued dedication to and support of this regional gem. I also thank the many foundations and corporations that value the Zoo and provide support in the way of grants, sponsorships, and corporate memberships. Your support has propelled the Zoo forward in countless ways.

I hope that you enjoy reading about the Zoo's progress in the pages of this annual report and will continue to show your support for the Zoo. It has been an honor and a pleasure to serve as Chair of the Board of Trustees, and I look forward to great things to come.

A handwritten signature in black ink, appearing to read "H. J. Warns III".

Hugo J. Warns III, Chair, Maryland Zoological Society, Inc

## *Letter from the President*

When I signed on as President of the Zoo over a decade ago, I had a particular goal in mind. I'm a life-timer in Baltimore, born and raised here, and I wanted the Zoo to once again be a primary destination for all Baltimoreans and visiting tourists. I wanted people to come to Druid Hill Park, enjoy this beautiful place, and take pride in their zoo. I'm happy to report that this year, we achieved that goal. In FY17, more than 500,000 people visited the Zoo – the highest attendance number in nearly 20 years!

There are hundreds of reasons that the Zoo is drawing so many people to its Main Gate and offering them unforgettable experiences. Count each amazing animal in residence as a reason, and then add on every conversation with a Zoo educator, every chat with a keeper, every school field trip, every fascinating public program, and every great event that we host. The list goes on and on, and behind every reason for visiting the Zoo are the dedicated staff, volunteers, Board trustees, and public and private supporters who make it possible. I am so proud of what we have accomplished, and continue to accomplish, together.

This year will be remembered for its remarkable animal news, both uplifting and sobering. We welcomed a pair of orphaned grizzly cubs, a young male southern white rhinoceros, two bobcats, a second sandhill crane, and many other new animals. We participated in potentially ground-breaking science with the artificial insemination of polar bear "Anoki." We also celebrated the birth of the first giraffe calf at the Zoo in over 20 years. A second giraffe calf soon followed but sadly, he survived only a few weeks. Despite tireless efforts by staff to save "Julius," the health challenges with which he was born proved insurmountable.

To every animal and to every case here at the Zoo, our staff brings incredible passion and professionalism. I have always remarked on this. To underscore the point, let me draw your attention to our three full-time veterinarians. As of this fiscal year, each has now attained a distinction shared by only 200 American veterinarians: board certification by the American College of Zoological Medicine (ACZM). To do so, Dr. Bronson, Dr. Rettenmund, and now Dr. Sander each had to complete specialty residency training in zoological medicine, publish five peer-reviewed articles as first author, and study for a full year in order to pass a rigorous two-day examination. The bar is set very high, and all of our veterinarians have met it.

As I say every year, we are grateful that community-at-large continues to support the Zoo and help it remain a vibrant and vital part of Druid Hill Park and the neighboring communities. I repeat it because it's true. Thank you for your support, and we hope to see you here often this year and in the years to come.



Donald P. Hutchinson, President/CEO



**DONALD P. HUTCHINSON**  
PRESIDENT/CEO

WITH SEVERAL HIGH-PROFILE ANIMAL ARRIVALS, FY17 MIGHT BE REMEMBERED AS THE YEAR OF NEW SPECIES, NEW ANIMALS, AND NEWBORNS.

# new at the zoo

Between July 1, 2016 and June 30, 2017:

- For the first time in over a decade, more than 500,000 guests visited the Zoo.
- Two female reticulated giraffes gave birth, marking the first giraffe births at the Zoo in 20 years.
- A pair of grizzly bear cubs rescued in Montana were brought to the Zoo and given a permanent home.
- A young male southern white rhino joined the Zoo's resident male southern white rhino at the African Journey Watering Hole.
- A new bobcat exhibit opened in *Maryland Wilderness*, now inhabited by one male and one female bobcat.
- A female sandhill crane came to the Zoo from Florida to join the male sandhill crane in the *Maryland Wilderness Marsh Aviary*.
- Many other animals also joined the Zoo's collection, including 1 plains zebra, 1 sitatunga, 1 warthog, 1 badger, 9 eastern box turtles, 2 ostriches, 15 African penguins, 8 Caribbean flamingos, and other bird species including spur-winged lapwing, hamerkop, fulvous whistling duck, and African spoonbill.
- Several other animals were either born or hatched at the Zoo in FY17, including 12 African penguin chicks, 1 Coquerel's sifaka, 1 eastern box turtle, 5 trumpeter swans, and scores of Panamanian golden frogs.

- A female polar bear became the first in Zoo history to undergo artificial insemination, at the recommendation of the AZA's Species Survival Plan (SSP) for polar bears.
- Several new special events and public programs helped pique public interest in the Zoo and drive record-breaking attendance, including Yoga at the Zoo and Zoo Bop, a family-friendly concert at Waterfowl Lake.

- Improvements large and small were made to several animal exhibit spaces, including modifications to the polar bear exhibit to accommodate grizzly bears, expansion and renovation of the Arctic fox exhibit and holding building, and addition of a new climbing structure to the Amur leopard exhibit.
- The Association of Zoos and Aquariums (AZA) awarded the Zoo a Top Honors Award in Exhibit Design for *Penguin Coast*, its African penguin exhibit.

- A newly created Conservation Department, led by Dr. Ellen Bronson, Director of Animal Health, Conservation, and Research, will oversee the Zoo's local, regional, and global conservation initiatives.
- The Zoo adopted a new branding look and signature, with updated logos, wayfinding signage, publications, and other graphic materials.



IN A YEAR OF BIG NEWS AND MOMENTOUS CHALLENGES, ANIMAL DEPARTMENT STAFF RESPONDED WITH UNWAVERING PROFESSIONALISM AND PROVIDED EXCEPTIONAL CARE TO EVERY ANIMAL AT THE ZOO.

# animal report



Between July 1, 2016 and June 30, 2017:

- Two giraffe calves were born at the Zoo, marking the first giraffe births in 20 years.
- Several other animals were born or hatched at the Zoo, including 12 African penguin chicks, 1 Coquerel's sifaka, 1 eastern box turtle, 5 trumpeter swans, and scores of Panamanian golden frogs.
- Two grizzly bear cubs orphaned in the wild in Montana were brought to the Zoo and given a permanent home.
- An impressively large, powerful, and curious young male southern white rhino also joined the Zoo's family and was successfully introduced to the Zoo's one other southern white rhino, an older male.
- The Zoo transformed its former red fox exhibit into a spectacular new bobcat exhibit

now inhabited by one male and one female bobcat.

- Many other animals joined the Zoo's collection, including 1 plains zebra, 1 sandhill crane, 1 sitatunga, 1 warthog, 1 badger, 9 eastern box turtles, 2 ostriches, 15 African penguins, 8 Caribbean flamingos, and other species of bird including spur-winged lapwing, hamerkop, fulvous whistling duck, and African spoonbill.
- A young trumpeter swan that hatched at the Zoo in 2016 was released in Iowa in support of that state's ongoing trumpeter swan reintroduction program.
- The Zoo hosted the 2017 AZA African Penguin Master Planning meeting, and Avian Collection and Conservation Manager Jen Kottyan was appointed to the Penguin Taxon Advisory Group (TAG) Steering Committee.
- Behavioral training programs continued to be an essential component of animal care at the Zoo, providing enrichment and facilitating husbandry and medical care for numerous species, including most significantly in FY17 for rhino, warthog, chimpanzee, sitatunga, cheetah, polar bear, giraffe, lesser kudu, and African elephant.
- Improvements large and small were made to several animal exhibit spaces, including modifications to the polar bear exhibit to accommodate grizzly bears, expansion and renovation of the Arctic fox exhibit and

holding building, and addition of a new climbing structure to the Amur leopard exhibit.

- Staff veterinarians examined 856 animals at the Zoo, ranging from half-ounce frogs to multi-ton African elephants, and successfully anesthetized 180 individual animals for either wellness or diagnostic examinations.
- Veterinary and animal staff teamed up with Cincinnati Zoo reproductive specialists to artificially inseminate polar bear "Anoki" with sperm donated by a male polar bear living at another AZA institution. Anoki became the first polar bear to undergo artificial insemination at the Zoo, at the recommendation of the AZA's Species Survival Plan (SSP) for polar bears. Polar bear pregnancy is difficult to achieve and has been minimally investigated; this novel procedure will contribute greatly to the science of polar bear reproduction and aid in developing a successful protocol for the species.
- Veterinary staff cared for multiple wild animals, including 19 wild birds, 10 mammals, and two reptiles rescued within the Zoo, within Druid Hill Park, or elsewhere in the state of Maryland. Wild patients ranged from small ovenbirds and wrens to several woodcocks in the spring to larger raptors such as a barred owl and a peregrine falcon fledgling.
- The Zoo's three veterinary technicians examined 921 blood and tissue samples from

# animal report (continued)



Zoo animals, searched for parasites in 826 fecal samples, and took 150 animal x-rays.

- In addition, veterinary technicians examined a record-breaking 987 African penguin blood samples – almost twice as many as in years past – as part of the Zoo’s intensive avian malaria screening program for this species. African penguins new to the collection are tested weekly during their first two summers in Baltimore for this disease, which can be carried by native birds and transmitted by mosquitoes.
- All three of the Zoo’s veterinarians are now board-certified through the American College of Zoological Medicine (ACZM), a distinction attained by only about 200 veterinarians. Few U.S. zoos have all of their staff veterinarians board-certified in this specialty. It requires completion of specialty residency training in zoological medicine, publication of five peer-reviewed articles as first author, and success on a rigorous two-day examination that demands at least one full year of study. Dr. Ellen Bronson passed the exam in 2007 and is now a member of the ACZM examination committee. Dr. Christy Rettenmund passed the exam in 2015 and Dr. Sam Sander passed most recently in September 2016.
- Seven veterinary interns and five veterinary technician interns benefitted from on-the-job training with the Zoo’s veterinary team.

The Zoo is committed to helping train the next generation of zoological experts. Dr. Sander currently serves as co-chair of the Education Committee of the American Association of Zoo Veterinarians.

- Three additional animal keepers joined the Animal Hospital staff as part of an ongoing reorganization of the Animal and Veterinary

Departments. These experienced keepers care for all animals in either treatment or quarantine at the hospital.

- The Zoo’s commissary team delivers food year-round, rain or shine, to all of the Zoo’s animals. In the past, they have delivered raw ingredients to keepers around the Zoo for diet preparation. This year, in an effort to increase

efficiency and reduce food waste, the team began preparing diets in the Commissary and then distributing them Zoo-wide. Aided by several dedicated volunteers, the team now prepares more than 100 diets each day, ranging from ½ ounce of salad for the Animal Embassy’s tiny Egyptian tortoise to 21 pounds of fruit and vegetables for the adult African bull elephant.

# conservation report

**In FY17, the Zoo formed a dedicated Conservation Department to oversee its many conservation initiatives.**

Dr. Ellen Bronson, the Zoo’s senior veterinarian and newly named Director of Animal Health, Conservation, and Research, is leading the Conservation Department. She has initiated a strategic planning process that will assess current conservation and research initiatives, prioritize future initiatives, create new opportunities for field work and original research, and promote projects in which the Zoo is currently engaged. Some of those projects are highlighted below.

## **Focus: Brown Pelican**

In August 2016, Zoo veterinary and animal staff traveled to islands in the Chesapeake Bay to assist biologists from the Maryland Department of Natural Resources (DNR) in banding and gathering biological samples from brown pelicans that will help assess the birds’ health.

## **Focus: American Black Bear**

In March 2017, veterinary and animal staff traveled to western Maryland to participate once again in the annual Black Bear Sow Health Survey led by the DNR. This long-standing collaboration between the Zoo and the DNR allows DNR biologists to monitor the health and numbers of Maryland’s black bears and to manage the species and its habitat requirements optimally while also considering the needs and concerns of local residents. Zoo staff helped

DNR biologists to safely immobilize and examine free-ranging black bear sows and cubs in Garrett, Allegany, Washington, and Frederick counties.

## **Focus: Bog Turtle**

Over the course of several months, Reptile and Amphibian Collection and Conservation Manager Kevin Barrett, Area Manager Kyle Baumgartner, and several Maryland Wilderness keepers participated in the DNR’s state-wide bog turtle survey. They accompanied DNR biologists and other volunteers to Maryland swamps and bogs to search for the tiny reptiles. Bog turtles are listed as critically endangered by the IUCN, the world’s leading conservation organization. There are small populations in several eastern U.S. states, including Maryland. For more than two decades, state biologists have been working with private landowners and conservation partners to conserve bog turtles in Maryland and restore their vanishing habitat.

## **Focus: Bald Eagle**

In April 2017, Zoo veterinary staff assisted the U.S. Fish & Wildlife Service (USFWS) in rescuing and rehabilitating a bald eagle chick hatched at the National Arboretum in Washington, D.C. Live video from an “eagle cam” trained on the nest revealed that the chick had become entangled in nesting material. The American Eagle Foundation, which maintains the camera, notified USFWS. A USFWS biologist rescued the chick and brought it to



the Zoo’s Animal Hospital, where it received appropriate care. The chick, “Honor,” stayed overnight at the Hospital, was returned to its nest the next day, and successfully fledged from the nest on June 22.

## **Focus: African Penguin**

In FY17, Zoo veterinary, animal, and education staff remained deeply involved in most of the eight projects that comprise the AZA SAFE African Penguin Conservation Action Plan. AZA’s SAFE program – Saving Animals From Extinction – seeks to protect threatened and

endangered species around the world through coordinated conservation action, leveraging of wildlife expertise, and public engagement. Working with partners in South Africa, General Curator Mike McClure is coordinating the Marine Movement Project and assisting with the Individual Identification Project. Area Manager Jess Phillips is coordinating the Disaster Response Project. Dr. Ellen Bronson and Dr. Samantha Sander, veterinary advisers to the AZA’s African Penguin Species Survival Plan (SSP), are contributing significantly to the African Penguin SSP Sustainability Project, with

# conservation report (continued)



support from Avian Collection and Conservation Manager Jen Kottyan. They are planning and leading research projects pertaining to the three most significant health concerns that affect African penguins living in zoos and aquariums: avian malaria, *Aspergillus* fungal infections, and molting problems. Kottyan also is collaborating on the Health Monitoring and Rehabilitation Project. Members of the Education staff are supporting the work of the Public Engagement Project.

## Focus: Sustainability

In its ongoing quest to prioritize sustainability, the Zoo continues to make strides across departments in energy efficiency, waste and recycling initiatives, and sourcing food locally. In FY17, the Education department started a Learning Garden on campus and spearheaded a project to place compost bins around the Zoo to reduce food waste and produce organic fertilizer for Zoo plantings. Meanwhile, the Commissary

and Horticulture departments started an off-exhibit vegetable garden that produced more than 20 pounds of vegetables in its first year, saving the Zoo money while sourcing food locally.

**In addition to its hands-on conservation work, the Zoo donates resources, knowledge, and support funding for field projects and conservation efforts of partner organizations. Maintaining direct and lasting partnerships with proven conservation organizations upholds the Zoo's conservation-driven mission while also providing more resources for improved animal management and enhanced staff development. In FY17, the Zoo supported the following organizations:**

### • International Elephant Foundation (IEF):

The mission of the IEF is to support and operate elephant conservation and education programs both in managed facilities and in the wild, with an emphasis on management, protection, and scientific research. Since 1999, IEF has provided support to over 80 elephant conservation projects worldwide and over \$3 million in direct financial assistance.

The Zoo has supported IEF since 2008 and also participates in the development of research initiatives.

### • The International Rhino Foundation (IRF):

The International Rhino Foundation is dedicated to the survival of the world's rhino species through conservation and research. At the heart of IRF's vision is the belief that these magnificent species should endure for future

generations and that protecting rhinos ensures the survival of many other species that share their habitat, including people. IRF supports and encourages the efforts of rhino keeper staff in educating the public and in collaborative efforts to address the critical conservation issues facing all rhino species. The Zoo has supported IRF since 2008.

### • The Madagascar Fauna Group (MFG):

MFG is an international consortium of zoos and other conservation agencies that pool resources to help conserve animal species in Madagascar through captive breeding programs, field research programs, training programs for rangers and wardens, and acquisition and protection of native habitat in Madagascar. The work that they do is critical to the survival of every lemur species exhibited at the Zoo, and the Zoo has supported their efforts since 2008.

### • The Okapi Conservation Project (OCP):

OCP works in the heart of the Democratic Republic of Congo (DRC) to protect the natural habitat of endangered okapi living in the Okapi Wildlife Reserve in the Ituri Forest. Designated as a World Heritage Site, the Reserve is one of the most biologically diverse areas in all of Africa and home to indigenous Mbuti pygmies. The Zoo has provided AZA-mandated support for OCP to help it recover from a devastating attack in 2012 and continue its important work on behalf of the Mbuti, the okapi, and all other species living within the

# conservation report (continued)



Reserve, including chimpanzees and colobus monkeys, which are featured along with okapi in the Zoo's collection.

- **Sahara Conservation Fund (SCF):**

The mission of SCF is to conserve the wildlife, habitats, and other natural resources of the Sahara and its bordering Sahelian grasslands in Africa. Established in 2004, SCF advances its goals by creating partnerships between communities, governments, zoos, the scientific community, and donor organizations. The Zoo has supported SCF since 2016 in

order to contribute to the preservation of this important African region, home to species such as the endangered Addra gazelle, which can be seen at the Zoo.

- **Mabula Ground Hornbill Project (MGHP):**

Founded in 2001, MGHP is working to slow the decline of southern ground hornbills in South Africa. These large, charismatic black birds, exhibited at the Zoo, are a flagship species of the African savannah. They are listed as vulnerable by the IUCN across their native range, but are endangered in South Africa. The Zoo supports the international Species Recovery Program for

the southern ground hornbill through its partnership with MGHP and plans to send staff to South Africa to gain expertise that will assist in our efforts to breed the species.

- **International Crane Foundation (ICF):**

The ICF works worldwide to conserve all 15 species of cranes and the ecosystems, watersheds, and flyways on which they depend. The Zoo supports the ICF and shares its commitment to protecting cranes. For decades, the Zoo has bred and cared for various species of crane and currently exhibits demoiselle cranes, black-crowned cranes, and sandhill cranes.

- **Tri-State Bird Rescue:** Located in Newark, Delaware, Tri-State Bird Rescue rehabilitates injured, orphaned, and oiled native wild birds, with the goal of returning healthy birds to their natural environment. The Zoo provides financial support to the important work of Tri-State Bird Rescue and has also partnered many times with Tri-State on the rehabilitation and release of individual birds, including bald eagles and snowy owls.

- **The Orianna Society:** Based in the state of Georgia, The Orianna Society aims to conserve critical ecosystems for imperiled North American reptiles and amphibians using science, applied conservation, and education. Their work includes efforts to improve habitat for hellbenders, a rare species of salamander native to Maryland and exhibited at the Zoo.

- **Crocodylian Conservation Center of Florida (CCCF):**

Founded in 2010, CCCF is committed to worldwide crocodile conservation and is working to establish a facility in Florida that will provide urgently needed holding space for endangered crocodylians that are currently managed in captivity as a part of the AZA's (Association of Zoos & Aquariums) Species Survival Plans and Studbooks. CCCF's founder, Bruce Schwedick, is an internationally renowned reptile expert and long-time consultant to the Zoo who has permanently loaned us our pair of African slender-snouted crocodiles, which are exhibited in Chimpanzee Forest.

- **Susquehannock Wildlife Society:**

Based in Harford County, Maryland, the Susquehannock Wildlife Society is a local non-profit organization dedicated to the preservation and protection of native wildlife through public programs and other endeavours.

- **Turtle Survival Alliance (TSA):**

TSA represents the largest and most active collection of zoo-based scientists and conservationists pooling resources to address critical issues facing turtles globally, such as habitat loss, population decline, and illegal collection of animals for the pet and/or food industry. TSA is comprised of organizations and individuals working together to transform passion for turtles into effective conservation action through a global network of living

# conservation report (continued)

collections and recovery programs. The Zoo has partnered with TSA since 2008.

- **Southern African Foundation for the Conservation of Coastal Birds (SANCCOB):** SANCCOB is an internationally operating organization based in South Africa that is dedicated to seabird research, rescue, rehabilitation, and education. Since its founding in 1968, SANCCOB has saved more than 85,000 seabirds and is the primary conservation organization working with African penguins. For many years, SANCCOB and the Zoo have exchanged knowledge and collaborated to advance research, education, and conservation of African penguins.
- **The Cheetah Conservation Fund (CCF):** Founded in 1990, CCF is the world's leading organization dedicated to saving the cheetah in the wild. CCF works with all stakeholders within the cheetah's ecosystem to develop best practices in research, education, and ecology and create a sustainable model from which all other species, including people, will benefit.
- **Polar Bears International (PBI):** PBI is the world's leading polar bear conservation organization. Its research, education, and action programs address the issues that are endangering polar bears. The Zoo has a long-standing partnership with PBI and supports their work through funding, on-grounds collaborations, and staff expertise.



- **Elephants for Africa (EFA):** EFA is a research organization and charity committed to protecting endangered African elephants and habitat in their range countries. Working in Botswana and South Africa, EFA conducts research to understand the ecological and social requirements of African elephants, puts this research into the context of human-wildlife conflict, and delivers scientific data to local

decision makers. Dr. Kate Evans, founder of EFA, has maintained a longstanding partnership with the Zoo and receives support through funding, information sharing, and collaboration on research projects to better understand the threats to African elephants in the range countries.

- **Project Golden Frog:** The Zoo is a founding member of Project Golden Frog, a consortium of Panamanian and North American institutions working to prevent the extinction of the Panamanian golden frog. Since 1999, the Zoo has shared expertise and resources with our Panamanian counterparts, with the goal of repatriation and reintroduction of this endangered amphibian to its native range.
- **The Goualougo Triangle Ape Project (GTAP):** The mission of GTAP is to promote the long-term conservation of chimpanzees and gorillas. It operates in an extremely unique region of the world: the Goualougo Triangle, a 100-square mile region of protected, pristine forest outside of and at the southern end of Nouabalé-Ndoki National Park in the Democratic Republic of the Congo. GTAP's "action-oriented" research is intended to assist the government in managing forest resources particularly vital to remaining groups of great apes in the region.
- **96 Elephants:** 96 Elephants is a campaign of the Wildlife Conservation Society, based at The Bronx Zoo in New York, to end the illegal poaching of elephants and curb the illegal ivory

trade. In supporting this campaign, the Zoo is contributing to the spread of awareness of the current elephant ivory poaching crisis that threatens the continued existence of elephants and other species impacted in the range countries where populations are diminishing rapidly.

- **The Adkins Arboretum:** Located on Maryland's Eastern Shore, the Adkins Arboretum promotes the appreciation and conservation of native plants to more than 18,000 visitors annually. The Zoo and the Arboretum maintain a longstanding partnership that allows for Zoo staff to collect sumac from the Arboretum's grounds each year, which is then fed to the Coquerel's sifaka. This endangered species of lemur requires a highly specialized diet that includes sumac browse. The Arboretum's partnership has been critical in allowing the Zoo to meet its sifaka husbandry needs and achieve ongoing success in breeding this species.

# education report



Between July 1, 2016 and June 30, 2017:

- 84,929 individuals visited the Zoo in association with the Free Admission program supported by the legislature and funded by the Maryland State Department of Education, as follows:

- 59,133 Maryland school children visited for free.
- 15,725 teachers and chaperones visited for free.

- An additional 10,071 people attended in association with a field trip at a reduced rate or were under the age of two and did not pay admission.

- During their visits, students participated in themed ZooTreks and hands-on Pop-up Labs that made connections between Zoo content and state and national curriculum standards.
  - ZooTreks are themed, self-guided tours that facilitate discussion as students explore

the Zoo by providing questions linked to specific animals and exhibits.

- Pop-up Labs allow students to apply real-life skills of animal observation and data collection in Zoo exhibit areas.

- 3,240 students participated in 134 paid or grant-supported school programs (ZOOlabs and Zoo Introductions) that stimulated students' critical thinking, supported reading skills, and addressed science, math, and life science topics. These programs were aligned with the Next Generation Science Standards and the Maryland College and Career-Ready Standards as appropriate.
- Zoo educators delivered classes and tours for 61 homeschooled children and their family members. In the Cheetah Cubs program, students aged 5 to 8 learned about taxonomy and classification of animals, with each class session focusing on the characteristics and special adaptations found among a particular group of animals. In the Lion's Pride program, students aged 9 to 12 learned about ways they could help protect local species, with sessions focused on citizen science, community-level conservation initiatives, and sustainable choices that students could make themselves.
- 121 children enrolled in the Zoo's week-long summer camp programs for children entering grades 2 to 6.

- Through its grant-funded Climate Change Partnership Program, the Zoo teamed with six Baltimore City middle school classes, helping students become active agents for environmental change.

- Five Baltimore City middle school classes participated in a grant-funded program about urban wildlife. Students came to the Zoo and engaged in a workshop empowering them to positively impact the natural world in their own backyards.

- Outreach education staff, assisted by Zoo volunteers, delivered 869 outreach programs to 46,009 people in communities across Maryland and beyond. Of those programs, 196 were grant-funded and delivered at no cost to Title I elementary schools, early education centers, and libraries throughout Maryland.

- Zoo educators on the Public Programs team developed and delivered a variety of on-grounds experiences to engage Zoo visitors and enhance their learning.

- More than 40,000 Zoo visitors participated in Education Stations, family overnights, puppet shows, walking tours, and other animal-centered activities facilitated by Zoo education instructors and volunteers.

- Zoo educators worked with colleagues in other departments to organize and lead seven Wild About Days, with each day

# education report (continued)

focusing on a particular endangered species, its conservation challenges, and action steps that people can take to prevent its extinction.

- Throughout the Zoo, interpretive signage was updated, revised, and added, enhancing exhibits with important information about animals, their habitats, and conservation concerns affecting their survival in the wild.
- Volunteer educators received in-depth training on several exhibit areas to enable them to effectively teach guests in these areas of the Zoo and to deliver the penguin feeding narration.
- A Learning Garden was planted at the Zoo to teach guests about sustainable gardening practices. School groups, summer campers, and youth enrolled in the BRANCHES program of the Parks and People Foundation have worked in the garden and explored its plantings as part of their educational experiences at the Zoo.



# volunteers



Between July 1, 2016 and June 30, 2017:

- 1,164 volunteers gave 40,200 hours of service to the Zoo.
- 371 people volunteered regularly throughout the year, interacting with guests and working behind the scenes.
- An additional 793 people volunteered for individual events and service projects.
- 83 teens participated in the Zoo Teen program,

formerly known as Junior Zoo Crew, the Zoo's service-learning program for youth aged 14-17. Zoo Teens averaged 82 hours of service each, educating guests about wildlife, beautifying the campus, caring for animals, and creating animal enrichment items for Zoo events. The teens also helped plant trees at an area nature center, conversed with Junior Zoo Crew alumni at a panel event, and jointly began preparing for the college application process.

- 50 college interns worked alongside Zoo staff throughout the year and completed projects in education, animal care, horticulture, writing, graphic design, new media, veterinary technology, archive management, audience evaluation, and volunteer management. Summer interns presented on their experiences and contributions during an end-of-session Intern Showcase.
- The Zoo held its fifth annual Teen Leaders Institute, a challenging eight-week program for underserved high school students who are considering a career in the non-profit sector. Nineteen juniors and seniors explored a variety of career paths with senior Zoo staff, attended a dress-for-success presentation by representatives from Gap, Inc., met with a local college admissions officer to discuss the college application process, and worked together to plan "Animal Art-Servation," a fundraiser to support general operations at the Zoo that showcased student artwork and craft projects.
- The Maryland Zoo Conservation Club, led by volunteers, continued its sustainability initiatives with a cell phone recycling drive (collecting 140 discarded phones in commemoration of the Zoo's 140th anniversary), a "spent pen" drive (plus markers and highlighters) that to date has diverted 35 pounds of plastic waste from local landfills, and a waste drive that resulted in more than 1,000 pounds of trash and

recyclables being picked up along the Zoo's perimeter fence line and properly disposed.

- New this year, volunteers formed a Diversity Committee to engage underrepresented communities as future volunteers and to ensure that the volunteer culture is fully inclusive.
- The Zoo's team of volunteer coordinators extended its professional contributions beyond the Zoo. Kerrie Kovaleski, Director of Volunteer Programs, serves as Vice-Chair of the AZA's Volunteer Management Committee and moderated a panel on Volunteers as Leaders at the AZA's annual national conference. Allison Schwartz, Manager of Volunteers, is the newly elected Chair of the Maryland Council of Directors of Volunteer Service. Kristi Giles, Manager of Volunteers, sat on the selection panel for the Governor's Office on Service and Volunteerism annual awards.

# institutional advancement

Between July 1, 2016 and June 30, 2017:

- The Maryland Zoo continued to receive invaluable support from the State of Maryland, the City of Baltimore, and Baltimore, Howard, and Carroll counties. Together, these governments provided more than half of the Zoo's operating funds and important capital improvements, with the State as the most significant contributor for capital improvements. We remain deeply grateful for government leaders' recognition and appreciation of the Zoo as a high-quality institution serving the community.

- The Zoo broke the half-million mark for attendance for the first time in more than a decade, with 505,723 guests visiting the Zoo in FY17.
- 14,000 member households supported the Zoo, resulting in more than \$1,500,000 in membership revenue. These numbers mark a new and encouraging milestone for Zoo membership. In exchange, those members received unlimited year-round admission to the Zoo, reduced admission to more than 150 other AZA organizations, special offers at local attractions, and more.

- Corporate memberships were also strong, with 119 local businesses contributing \$415,000 in support of the Zoo while also providing a cost-effective benefit to their employees.
- Many generous individual and corporate donors supported the Zoo through gifts to The Maryland Zoo Fund, the ADOPT program, and targeted capital improvements. The Zoo was also the grateful beneficiary of gifts made in honor or in memory of loved ones.
  - Individual donors contributed \$760,000 that will directly support general operating expenses.
  - The number of new Zoo supporters rose more than 10% year-over-year, marking the most successful year to date for new donor acquisition.
  - The Zoo, having been accepted into the Maryland State Department of Housing and Community Development – Community Tax Credit Incentive (CTCI) program, can now offer donors the opportunity to receive additional tax credits above and beyond standard deductions.
- Foundations and philanthropic funds in the region granted monies for the vital services of our day-to-day operations, educational programming, and capital projects.
- By offering a compelling array of perennial favorites and new events, the Zoo's Events Team had its best year yet. For the first time

in Zoo history, event revenue surpassed the \$1,000,000 mark.

- 11,000 festival-goers turned out for Brew at the Zoo, the Zoo's largest fundraiser, generating \$500,000 in revenue.
- Enthusiasm was equally strong for the "Breakfast with the Animals," "Paint and Sip," and newly offered "Yoga at the Zoo" series, each of which sold out fully in advance.
- To commemorate its 140th anniversary, the Zoo hosted a Zoobilee celebration that generated more than \$140,000 in revenue.
- Group Sales had another strong year, successfully filling the calendar with private, nonprofit, and corporate rentals and retreats; fundraising walks and picnics; group visits, group tours, and behind-the-scenes tours; birthday parties; and visits from consignment ticket holders, including those who serve in the military along with their families.
  - Group Sales exceeded its revenue goal by 17%.
  - A total of 101 groups booked Zoo experiences through Group Sales.
  - Once again, the Zoo won Wedding Wire's Couples Choice Award, with the Mansion House Porch and Lakeside Pavilion remaining extremely popular places for couples to tie the knot. The Zoo's average Wedding Wire review rating was 4.9 out of 5, with 11 of the 13 reviews rating the Zoo a 5 out of 5.



# institutional advancement (continued)

- The Zoo's Public Relations Department continued to share timely and compelling news with a vast audience via local, national, and international news sources.
- Along with local television spots each month, the Zoo's Animal Ambassadors made multiple appearances on national television shows with San Diego Zoo Global staff, including NBC's Today Show, ABC's LIVE with Kelly & Ryan and FOX's Fox & Friends.
- Zoo animals and staff were featured in a number of news stories during the year, with exceptional coverage devoted to the births of Willow and Julius, the Zoo's first two giraffe calves in 20 years. Sadly, Julius did not survive despite extraordinary efforts on the part of Zoo staff, but intense and thoughtful media coverage made it possible for thousands of people around the world to understand and appreciate the challenges he faced and the professionalism and dedication of those trying to save him.
- The Zoo's Marketing Team continued to generate interest and excitement for the Zoo on many platforms and in many ways.
  - Marketing introduced an updated Zoo logo featuring key conservation species that is being used in all print materials, online channels, and Zoo communications. The Zoo's new hashtag – #ALL FOR ANIMALS – underscores its commitment to wildlife advocacy.



- The Zoo's dynamic and engaging website continued to attract more people than ever, as evidenced by 788,531 unique visitors (representing a 10% increase) and 2,957,454 page views (representing a better than 8% increase).
- More than 68,000 people subscribed to Zoo e-mail in response to expanded e-mail marketing efforts and a new delivery platform. Email marketing engagement also improved, with more "opens" and "click-thrus" than ever before.
- The Zoo's social media audiences continue to grow, breaking new engagement records.
  - Our Facebook audience increased by more than 40,000 new followers to a total of 184,159, which represents a 28% increase.
  - Our Twitter, Instagram, YouTube, and Pinterest audiences also grew significantly. Most notably, the Zoo attracted more than 32,000 Instagram followers, representing an increase of nearly 50% over the previous year.

- The Zoo's Marketing Team also collaborated with colleagues in other departments, providing creative services and promotional materials to support attendance, events, membership, development, and education programming. These efforts included a redesign of Zoogram magazine, refreshed collateral materials for Membership, and new Zoo business materials featuring updated branding.
- The Zoo's advertising agency of record, Mission Media, provided valuable support to the Marketing Team and collaborated on a new creative campaign that included updated television spots, digital advertising, colorful new billboards, and print ads that helped introduce the Zoo's new visual branding. The campaign highlighted signature species and high-profile animals such as the new baby giraffe, new grizzly cubs, and new bobcats.

# financials

## Contributed Income

State of Maryland	\$ 6,127,379
City of Baltimore	1,436,006
County Grants	519,986
Foundation Grants	311,066
General Support	
<i>Annual Fund</i>	<i>619,565</i>
<i>Corporate</i>	<i>509,645</i>
<i>Other</i>	<i>144,464</i>
Total General Support	<u>1,273,674</u>
Contributed Income	<u>9,668,111</u>

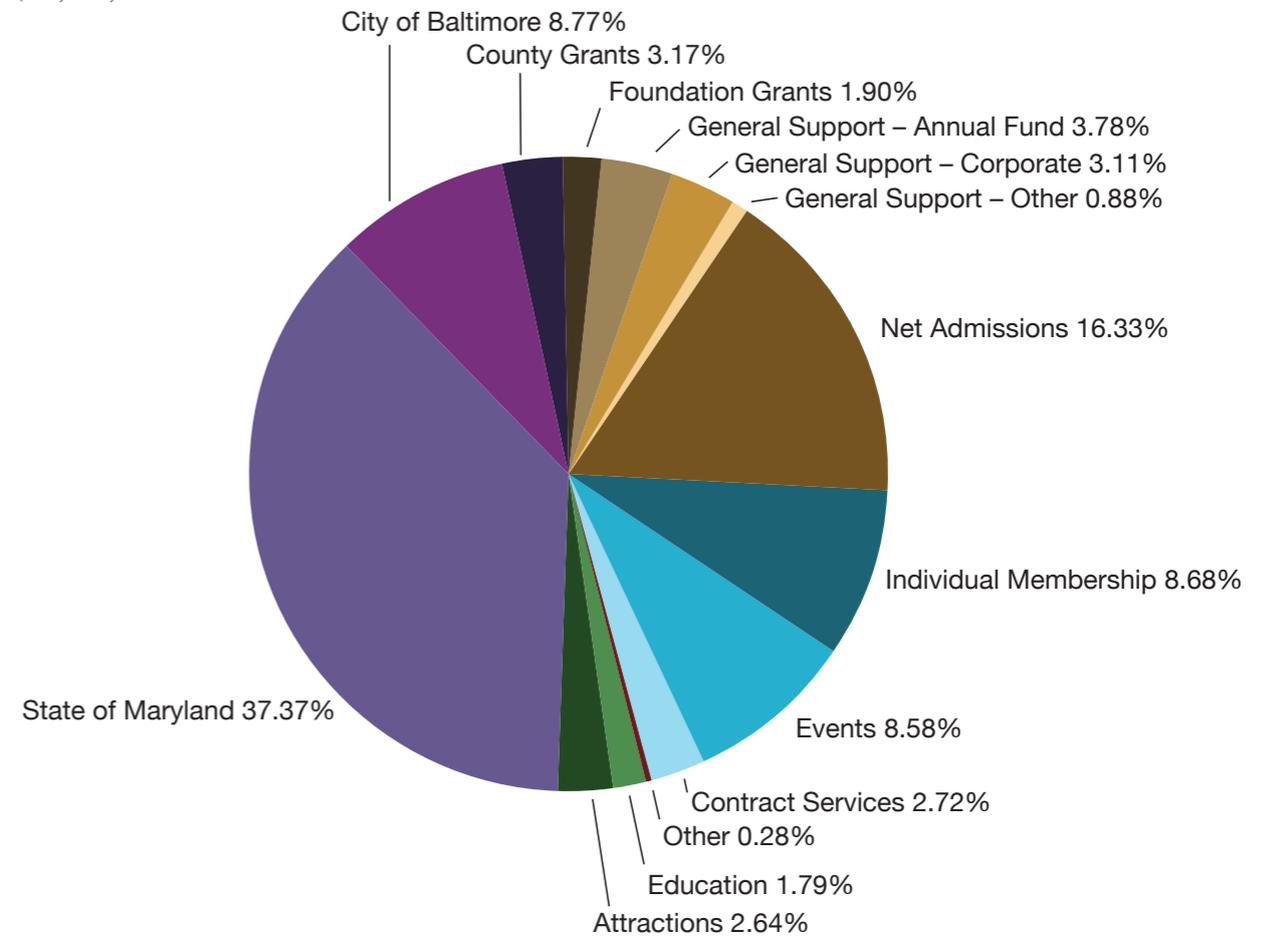
## Earned Income

Net Admissions	\$ 2,677,781
Individual Memberships	1,423,870
Events	1,407,613
Contract Services	446,542
Attractions	433,648
Education	293,641
Other	46,600
Earned Income	<u>6,729,695</u>
Operating Revenues	<u>\$16,397,806</u>

**Net Capital Support – used to fund capital projects** \$2,524,555

## Support & Revenue

TOTAL REVENUE  
\$16,397,806



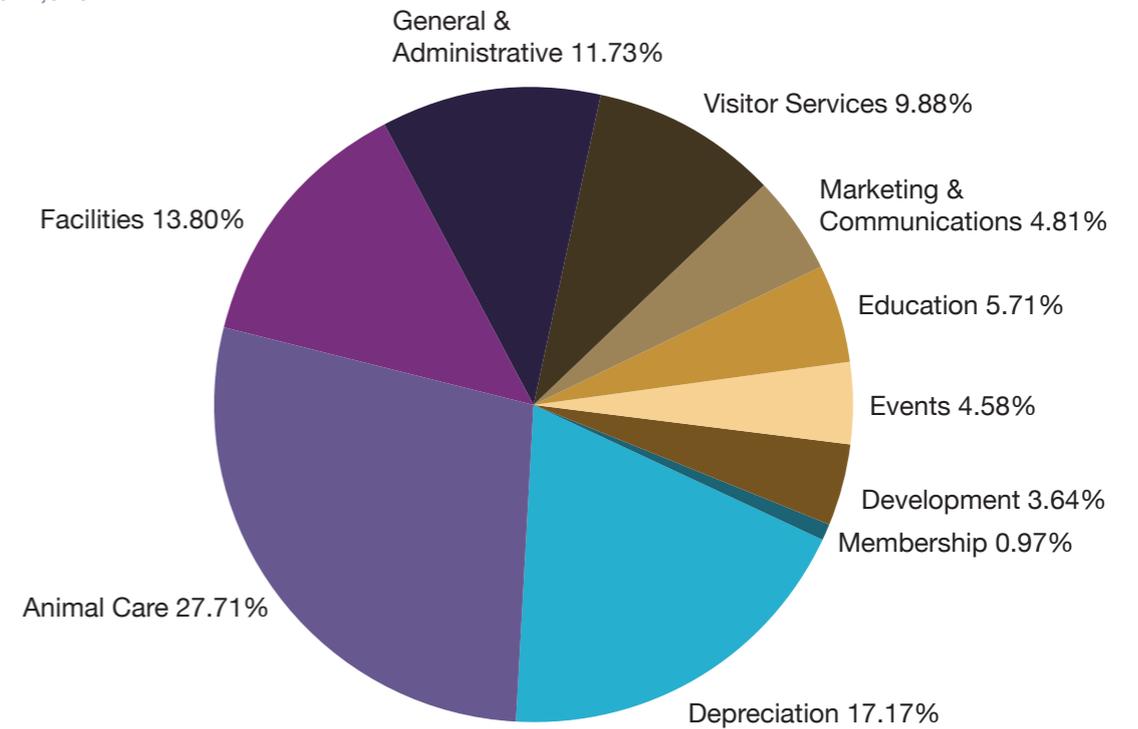
# financials



Expenses	
Animal Care	\$ 5,423,701
Facilities	2,700,711
General & Administrative	2,295,197
Visitor Services	1,932,025
Marketing/Communications	942,239
Education	1,118,484
Events	896,800
Development	711,606
Membership	190,052
<b>Operating Expenses Before Depreciation</b>	<b><u>16,210,815</u></b>
Depreciation	3,360,755
<b>Operating Expenses</b>	<b>\$19,571,570</b>

## Expenses

TOTAL EXPENSES  
\$19,571,570



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# staff research projects and publications

## RESEARCH PROJECT PARTICIPATION

### African Elephants

#### Determination of Safe and Effective Dosing Regimens for Flunixin Meglumine and Firocoxib in African and Asian Elephants

- *Urusla Bechert, Dawn Booth, Mark Christensen, Jack Kottwitz*

This project will determine appropriate dosing regimens for two of the most commonly used anti-inflammatory drugs used to treat elephants in captivity and for which dosing requirements for elephants are not known. Determining the pharmacokinetics and Cox1:Cox2 ratios for Banamine and firocoxib will help veterinarians utilize these medications more effectively in the treatment of a variety of conditions affecting captive elephants, especially musculoskeletal disorders.

#### Developing Genomic Tools for Elephant Conservation holdover to FY17

- *Natalia Prado-Oviedo, Janine L. Brown, Jesus E. Maldonado, Michael Campana*

This project will generate the first high coverage genome sequences of African and Asian elephants, which will be used to assess genetic variation and enable genomics projects in elephants to address fundamental questions about individual and population health and species survival. Genetic markers from these analyses will provide crucial information on the demographic history of our managed populations of elephants and will provide detailed estimates

of how individuals are related to each other and eventually, how they are related to wild populations.

#### Metagenomic analysis of intestinal microbiota of African elephants holdover to FY17

- *Petra Tsuji, Larry Wimmers, Brian Masters*

The intestinal microbiome has been studied extensively in humans and mice, and has been shown to be responsive to diet, environment, health, and other not yet identified factors. Furthermore, these studies have underlined the importance of intestinal bacterial communities for host survival, physiology, and nutrient utilization. The composition of the intestinal microbiota of African Elephants is currently unknown. Bacterial DNA was isolated from sterilized elephant dung samples, provided by the MZiB during routine husbandry procedures, and bacterial genome was sequenced and analyzed. Results from this study allow insights into the phylogeny and genetic potential of the intestinal microbiome.

### African Penguins

#### Improvement of the Diagnosis of Aspergillosis in Penguins

- *Carolyn Cray*

Aspergillosis is an airborne fungal infection and a major cause of morbidity and mortality in penguins. The definitive diagnosis of the disease is challenging since clinical signs and current test options are not specific. The objective of this SAFE (Saving Animals from Extinction) supported study is to investigate the inflammatory response

in blood samples of penguins infected with *Aspergillus* spp. through qualitative and quantitative approaches in an attempt to develop a more specific and sensitive test for this disease in penguin species. MZiB provided a significant number of blood samples from penguins with and without clinical disease to greatly add in the development of these diagnostic assays.

#### Pharmacokinetics of the antimalarial drug primaquine in African penguins (*Spheniscus demersus*)

- *Ellen Bronson, Marike Visser, Jen Kottyan, Sam Sander*

The objective of this project is to determine the effective dose of the drug primaquine in African penguins. This drug is the most commonly used medication for the prevention and treatment of avian malaria, one of the most common causes of death in captive penguins. As part of the SAFE (Saving Animals from Extinction) Sustainability Plan, the results of this study will enable the SSP and veterinarians at AZA institutions to make scientifically based recommendations for dosage and administration of this drug in the African penguin and other penguin species, and would be the first pharmacologic study of an antimalarial drug in a bird species.

#### Design of an anti-human tyrosinase specific enzyme-linked immunosorbent assays (ELISA) for use in measuring human tyrosinase antibody serum levels in African Penguins (*Spheniscus demersus*) vaccinated with a xenogenic plasmid DNA vaccine coding for human tyrosinase

- *Barbara Mangold, Jeff Phillips, Luis Lembcke*

The anti-penguin antibody will need to be tested to confirm that this antibody is tagged and available for use in the ELISA assay. If the anti-penguin antibody is tagged, then it will be used in the above assay to measure human tyrosinase antibody serum levels in African Penguins vaccinated with the Oncept® vaccine. MZiB provided anti-penguin antibodies for this project, which had been previously developed at the Zoo for other research projects.

### Chimpanzees

#### Tool Use in Chimpanzees and Bonobos

- *Lindsay Mahovetz, William D. Hopkins*

The project aims to investigate underlying factors contributing to tool use to aid in the understanding of chimpanzee and bonobo behavior and cognition. By studying primate species and factors underlying tool use we can begin to uncover what types of intrinsic motivations lead to proficient tool use. The ability to switch between tool modalities (physical to social) requires flexibility in behavior. Being able to adapt one's behavior in an ever-changing environment is vital for life, both on a day-to-day scale and overall survival.

# staff research projects and publications (continued)

Captive settings often provide changing environments by changing group members, rotating exhibits/holding areas, adding new structures or objects to exhibits/holding areas, etcetera. Behavioral observations were performed over several weeks with our chimp troop to provide important data for this study.

## **Validating WelfareTrak® as a Tool to Improve the Welfare of Individual Chimpanzees**

- *Jessica C. Whitham, Lance Miller, Steve Ross, Mollie Bloomsmith*

Using WelfareTrak®, a web application that allows zookeepers to complete surveys for individual animals and then generates reports that “flag” potential shifts in welfare status, zoos will have the ability to enhance overall quality of life for chimpanzees under their care. The study will be conducted over a 12 month period of time beginning in March 2016. Chimp Forest keepers collected behavioral and physiological data on all members of the troop, videotaped each individual 3 days a week for 30-minute time periods, and collected daily fecal samples for subsequent enzyme immunoassay analysis and to determine secretory immunoglobulin-A concentrations. The completion of this study will promote exceptional welfare by allowing keepers to focus on positive welfare indicators and the experiences, preferences and needs of individuals in the troop.

## **Retrospective Classification and Management Assessment of Canine Fractures in Captive Managed Populations of Great Apes**

- *Jill Moyse, Kathryn Gamble, Kimberly Ruona, Douglas Winter*

This project surveys retrospectively the current captive managed ape populations through records to identify animals that have presented canine fractures, cracks or breaks. Full exploration of this information will permit prospective planning and advice for future similar concerns in these species. MZIB provided current and historic medical information for the Zoo’s chimpanzee troop regarding dental health.

## **Panamanian Golden Frogs**

### **Exogenous Hormone Induction of Oviposition in Gravid Panamanian Golden Frogs (*Atelopus zeteki*) holdover from FY17**

- *Ellen Bronson, Kevin Barrett*

For fiscal year 2017, The Maryland Zoo in Baltimore continued to conduct this ongoing research study to further optimize the protocol used for obtaining eggs from frogs in order to increase our success in obtaining healthy offspring while decreasing the mortality of gravid females.

### **Noninvasive Individual Identity Tracking in the Panamanian Golden Frog**

- *Erik Lindquist, Alyssa Sargent, Kevin Barrett, Ellen Bronson*

For this study, dorsal and ventral photography of Panamanian golden frogs was obtained from MZIB frogs. The photography will be analyzed to in order to identify and track individuals’ identities

based on physical characteristics such as color or patterning, a method that is less invasive than other commonly used marking methods such as toe clipping, elastomer injections, or PIT tagging. This research will provide a useful and preferential method for monitoring populations both in the wild and in captivity.

## **PGF Oviposition Study**

- *Erik D. Linquist, Micah Christensen, Olivia Deloglos*

This study examines how factors such as the length, weight, and age of the parents affect the number of eggs that are laid and fertilized through selection of breeding pairs and analysis of their resulting eggs under a microscope. MZIB worked with students, who counted egg masses over the past breeding season. The information gleaned from this study will be used in predictive models (i.e. Vortex Population Viability Analysis software) in order to analyze the feasibility of suggested reintroduction scenarios.

## **The Accumulation and Half-Life of Itraconazole in Panamanian Golden Frogs (*Atelopus zeteki*) holdover from FY17**

- *Amy Rifkin, Marike Visser, Kevin Barrett, Dawn Boothe, Ellen Bronson*

Itraconazole is an antifungal drug customarily used to treat chytridiomycosis and other fungal infections in amphibians. This study is the second part of a larger study and aims to determine the proper dosing protocol by exposing different groups of frogs to various bath doses and lengths over 10 days. The results of this study should yield a recommended bath regimen for this species to treat fungal diseases while avoiding toxicity.

## **Saddle-billed Stork**

### **Determination of circulating vitamin and mineral levels in captive Saddle-billed Storks *Ephippiorhynchus senegalensis* as it may relate to reproductive success and embryonic development**

- *Jan Raines, Kerri Slifka*

As fecundity of this species in captivity is dropping from previous levels, and with the report of developmental abnormalities in recent hatchlings, there are concerns that there is a nutritional basis for these incidents. MZIB provided blood samples to aid in determining expected normal blood values for saddle-billed storks. Results will be analyzed to determine diet/supplementation needs and shared throughout SSP holding institutions.

## **Waldrapp Ibis**

### **Developing new tools for integrating DNA data into AZA breeding programs (an IMLS funded project for 2015-2018)**

- *Andrea Putnam, Jamie Ivy, Emily Latch*

Waldrapp ibis have been chosen as one of the 5 pilot species being studied to examine how genomic data can be used to resolve unknown pedigrees. MZIB provided whole blood samples to determine relatedness among the captive population to improve breeding recommendations and ensure the long-term retention of gene diversity.

# staff research projects and publications (continued)

## PUBLICATIONS

**Bronson E, McClure M, Sohl J,** Wiedner E, Cox S, Latimer EM, Pearson VR, Hayward GS, Fuery A, Ling PD. 2017. Epidemiologic evaluation of elephant endotheliotropic herpesvirus 3B infection in an African elephant (*Loxodonta africana*). *Journal of Zoo and Wildlife Medicine*. 48: 335-343.

Rifkin A, Visser M, **Barrett K,** Boothe D, **Bronson E.** 2017. The pharmacokinetics of topical itraconazole in Panamanian golden frogs (*Atelopus zeteki*). *Journal of Zoo and Wildlife Medicine* 48: 344-351.

Ihms EA, Rivas A, **Bronson E,** Mangus LM. 2017. Pigmented villonodular synovitis in a reticulated giraffe (*Giraffa camelopardalis*) *Journal of Zoo and Wildlife Medicine*. 48: 573-577.

Rivas A, Hausmann JC, Gieche J, Wallace R, Williams C, **Bronson E.** 2017. Clinical management of third phalanx fractures in lesser (*Tragelaphus imberbis*) and greater kudu (*Tragelaphus strepsiceros*). *Journal of Zoo and Wildlife Medicine* 48: 171-178.

**Rettenmund CL,** Boyer DM, Orrico WJ, Parker SG, Wilkes RP, Seimon TP, Paré JA. 2017 Long-term oral clarithromycin administration in chelonians with subclinical *Mycoplasma* spp. infection. *Journal of Herpetological Medicine and Surgery* 27: 58-61.

Schiaffino F, **Sander SJ,** Pereira ME, Kiupel M, Murray SZ. Cerebellar neoplasia in a Nile hippopotamus (*Hippopotamus amphibious*). *Journal of Zoo and Wildlife Medicine*, 2016; 47(4):1093-1093.

Perry SM, **Sander SJ,** Mitchell MA. Integumentary System. In: Mitchell MA, Tully TN (eds). *Current Therapy in Exotic Pet Medicine*. Elsevier. St. Louis, MO. 2016

## LECTURES AND PRESENTATIONS

**Sohl J.** 2016. Elephant Hematology wetlab: A comprehensive path from blood draw to send out. Association of Zoo Veterinary Technicians Conference. Tulsa, Oklahoma.

**Bronson E,** Sim R, Hausmann J, Adamovicz L, Barrett K. 2016. Lessons learned regarding survival, carrier status, and recurrence of ranavirus (FV3-like virus) after an outbreak in Eastern box turtles (*Terrapene carolina carolina*) in Maryland, USA. *Wildlife Disease Association Conference*. Ithaca, New York.

**Dr. Ellen Bronson:** Comparative physiology of the gastrointestinal tract. *Midwestern University College of Veterinary Medicine*. Glendale, Arizona. Invited guest lecturer for *Veterinary Physiology* course, May 2017.

**Dr. Ellen Bronson:** The zoo veterinarian's role in conservation. *University of Pennsylvania School of Veterinary Medicine*. Annual guest lecture, February 2017.

**Dr. Ellen Bronson:** Diseases of captive and free-ranging mammals. *University of Maryland College Park*. Undergraduate lecture for biology and animal science majors. Annual guest lecture, November 2016.

**Dr. Sam Sander:** Diseases of fish and reptiles, *University of Maryland College Park*.

Undergraduate lecture for biology and animal science majors. Annual guest lecture, November 2016.

**Dr. Sam Sander:** *University of Maryland Pre-Vet Club*. The Role of the Zoo Veterinarian. October 2016.

Dr. Samantha Sander, **Associate Veterinarian,** spent one week in November 2016 at the *University of Illinois College of Veterinary Medicine* as a clinical locum. She gave several lectures to veterinary students and oversaw clinical cases for the *Zoological Medicine Service and Wildlife Medical Clinic*.

**General Curator Mike McClure:**

- lectured at the AZA Principles of Elephant Management 1 and 2 courses
- ran the foot care workshop at the Elephant Managers' Association conference
- acted as a member of the conference development committee and gave 2 lectures at the RECON workshop on elephant management at Cheyenne Mountain Zoo
- was invited to participate in the Zoo Animal Welfare workshop at Zoo Leon, Mexico and gave 4 lectures to participants

**Area Manager Bethany Cornwall** presented a lecture on the S.T.A.R.S elephant training method at the annual AZA Elephant Managers' Association conference.

**Area Manager Pam Carter** presented a lecture on Chimpanzee training at the annual AZA Chimp Husbandry Workshop

Lori Beth Finkelstein, **VP of Education, Interpretation, and Volunteer Programs,** taught an undergraduate class at Johns Hopkins University titled *Zoo and Communities*. The semester-long course, offered through the University's Museums and Society program, taught students about zoos and living collections from historical and contemporary perspectives. As part of their course work, students created educational activity booklets for guests to the Zoo's different *Wild About Animals* days in partnership with children enrolled in a JHU—supported STEM after-school program at Arlington Middle/Elementary School in Baltimore City.

At the 2017 Association of Zoos and Aquariums (AZA) conference, Katie Manion, **Assistant Director of Education,** participated in *A Symposium on Zoo and Aquarium-Community Partnerships for Deep Engagement in Under-Resourced Communities and moderated the session entitled Engaging Visitors and Meeting Animal Needs through Enrichment and Animal Ambassador Programs*.

At the 2017 AZA conference, Sharon Bowen, **Education Manager for School and Teacher Programs,** presented a session entitled *Helping Teachers and Students Succeed: Addressing NGSS, STEM and CC and led the portion entitled Exhibit Design Program: Tackling the Standards with Project-based Learning*. Bowen also led a round-table session on re-imagining field trips.

# We could not do it without you!

Your generosity allows the Zoo to continue offering excellent animal, education, and conservation programs, to provide an exemplary visitor experience, and to assure a clean and safe environment for our animals, staff, and guests from all over Maryland and the region. Our genuine thanks go to you, our faithful friends, who year after year support the Zoo with your philanthropic donations, enabling us to make the wonders of wildlife accessible to the entire community.

# Thank you!

## Government Support

The Maryland Zoo continued to receive invaluable support from the State of Maryland, the City of Baltimore, and Baltimore, Howard, and Carroll counties. Together, these governments provided more than half of the Zoo's operating funds and important capital improvements, with the State as the most significant contributor for capital improvements. We remain deeply grateful for government leaders' recognition and appreciation of the Zoo as a high-quality institution serving the community.

## Individual Annual Giving

The Maryland Zoo is a nonprofit organization that must raise nearly half of its operating budget from private sources every year. Our heartfelt thanks go out to the following donors, whose sophisticated understanding of the importance of support for daily operations led them to contribute \$100 or more to our Annual Fund between July 1, 2016, and June 30, 2017. Their generosity enabled us to finish our fiscal year in the black for the sixth year in a row.

*Every effort was made to ensure the accuracy of this listing of donors. We regret any inadvertent omissions or errors and ask that you bring these to the attention of the Development Department by calling 443-552-5293.*

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 towards the care of our Southern  
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Suzanne Blair

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Linda Hayes

Elijah Johnson

Thomas Levickas

Larry Martin

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Peggy Sullivan

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 Maya Aziz  
 Kayla Baker  
 Marta Barrett  
 Carlee Berkenkemper  
 Alexis Bjurling  
 Erica Boehm  
 Kelly Boland  
 Ann Bolek  
 Alexandra Bosworth  
 Elaine Bowen  
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 Joanna Hildebrand  
 Sallyanne Howard  
 Caroline Izzi  
 Mia Jones

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 Glenn Lichtman  
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 Rachel Martinez  
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 Grace Morris  
 Albert Muehlberger  
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 David Wallace  
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 Maya Aziz  
 Kayla Baker  
 Marta Barrett  
 Carlee Berkenkemper  
 Alexis Bjurling  
 Erica Boehm  
 Kelly Boland  
 Ann Bolek  
 Alexandra Bosworth  
 Elaine Bowen  
 Alena Bowman  
 Mikayla Call  
 James Campbell  
 Skyler Carr  
 Julia Carter  
 Annalea Cascio  
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 Mary Rose Cook  
 Joe Corcoran  
 Matt Dalgetty  
 Nancy DeBell  
 Julia Dimaio  
 Joleen Dinolt  
 Mary Dobrzynski  
 Cathryn Doyle  
 Thomas Doyle  
 Mahlon Fogle  
 Emmy Foty  
 Victoria Fowler  
 Sabrina Frink  
 Kelly Gable  
 Briana Gooden  
 Jessie Gordon  
 Susan Grady  
 Noelle Gressitt  
 Erin Hanmer  
 Joanna Hildebrand  
 Sallyanne Howard  
 Caroline Izzi  
 Mia Jones  
 Alan Katz  
 Helen Kiefert  
 Susan Landers  
 Barbara Lazar

Anna Liberatore  
Glenn Lichtman  
Jeffrey Lifton  
Erin Marsh  
Hilde Martin  
Rachel Martinez  
Tou Matthews  
Grace Mooney  
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Barbara Pilert  
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Ellon Ruschell  
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Stephen Taylor  
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Jennifer Thorpe  
Pat Turnbaugh  
Nathan Vorachack  
John Wagener  
Julie Waldfogel  
David Wallace  
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Holly Barnowich  
Heather Bertling  
Barbara Bien  
Beth Bishop  
Rachel Bragg  
Michael Brown  
Joshua Chatmon  
Jessica Clarke  
Jeffrey Clayten  
David Clifford  
Savannah Collins  
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Audra Young  
Xinting Yu  
Adam Zurgable  
Anna Zwingelberg

#### 1-49 HOURS

Caroline Abrams  
Akshata Almad  
Mara Amerson  
Grace Anderson  
Kayla Anderson  
Ryley Anthony  
Victoria Anthony  
Kathe Apesos Poulos  
Maria Aranda-Lopez  
Markos Araya  
Brittany Astor  
Andy Aybar  
Courtney Badeaux-Hamm  
Dacia Balch  
Sarah Baldwin  
Makaila Ballah  
Valerie Barclay  
Chloe Bates  
Portia Baum  
Jasmin Beltre  
Mike Beltre  
Gail Bending  
Kaylin Bending  
Morgan Bengel  
Scottie Berk  
Brianna Bing  
Brianna Bing  
Christine Biser  
Stephanie Blair  
Sara Blickenstaff  
Matt Bocian  
Emily Bomgardner  
Sarah Bomgardner  
Melissa Bonzelet  
Sara Borowy  
Gina Bounds  
John Bowie  
Audrey Bowman  
Tom Boyle  
Christine Brady  
Leanna Brady  
Lindsay Brandt  
Corinne Brown  
Joseph Brown  
Laurianne Brown  
Abigale Brown  
Susan Browning  
Robert Browning

Alyssa Browning  
Emily Buras  
Amy Burke  
Arnetra Burnett  
Kimberly Butcher  
Clive Butler  
Asante Buzeneswatson  
Leslie Cain  
Rebecca Cain  
Russ Cain  
Loisa Camacho  
Christopher Cambron  
Atticus Cameron  
Shawn Campion  
Kasey Caparella  
Steven Carannante  
Eamonn Carr  
Bill Carson  
Donna Carter  
Bernard Cataldo  
Teresa Catroppo  
Dave Chason  
Pat Chason  
Zhijie Chen  
Serena Chenery  
Jennifer Chin  
Michelle Chism  
Will Chou  
Andrea Christ  
Cesare Ciccanti  
Celina Cisneros  
Satoya Clark  
Shaun Clear  
Mark Cobuzzi  
Gabriella Colarusso  
Robert Coles  
Paula Conti  
Christopher Cook  
Nichole Cook  
Joseph Copsey  
Hannah Crystal  
Timothy Dalgo  
Noah Daniels  
Rhiannon Davis  
Berenice Davy  
Erin Dawson  
Philip Dayao  
Kathy Defrancesci  
Jennierose Delia-Dufour

Tammy Delsanto  
Sharon Derby  
Brooke Derrenberger  
Adrienne Diestelkamp  
Danielle Drell  
Abby Drell  
Brian Dufour  
Alex Dumitrescu  
Mandy Dunlap  
Gloria Dunton  
Roslyn Dupree  
Sherry Durandetto  
Thomas Durandetto  
Martine Duvall  
Brad Dwin  
Judith Dwyre  
Nathaniel Dwyre  
Kevin Dyke  
Patty Dyke  
Ryan Dyke  
Patricia Edens  
Edna Egal  
Sandy Eikner  
Kalin Elliott  
Brooke Ensey  
Mary Jane Epley  
Laura Epps  
Lindsay Esposito  
Jasmine Estrada  
Irina Feig  
Henry Fether  
Christine Fichter  
Jalen Fisher  
Richard Fishkin  
Allison Fleming  
Alexis Fleming  
Tim Forney  
Michell Foster  
Paula Frankos  
Dean Freeman  
Archibald Frisby  
Weiyi Fu  
Nicholas Fuhr  
Alix Gadow  
Becki Gannon  
Patrick Gardullo  
Tony Gatto  
Meghan Gawryck  
Matthew Goetz

Michael Golob  
Roy Gonen  
Fawn Gordon  
Clayton Grace  
Rhonda Greenway  
Manya Greif  
Tina Gromling  
Kathy Guins  
Paul Gussack  
Cedric Haller  
Mookesh Hardial  
Zoe Hardy  
Shelly Harper  
Thelma Harrington  
Kim Harris  
Biggs Harrison  
Charles Hart  
Trevor Hartl  
Reiley Hartmuller  
Mary Harty  
Mike Harty  
Sierra Heim  
Jason Held  
Kellie Heslen  
Sheryl Heydt  
Davontae Hightower  
Ashlyn Hill  
Ashley Himelfarb  
Kayla Hines  
Kathryn Hirsch  
Stacey Hlatky  
Joe Hlatky  
Ayden Hoes  
Patricia Hogeland  
Francesca Horner  
Lucy Hough  
Elisabeth Hubbard  
Sean Hyatt  
Anita Iseman  
Kelsey Ivy  
Evelyn Jackson  
Cyndy James  
Jenny Jean  
Lisa Jeffrey  
Stephen Jenkins  
Narendra Jha  
Xiang Ji  
Marie Johnson  
Keyarra Johnson

Benjamin Jones  
Erin Jones  
James Ashley Jones  
Stuart Jones  
William Kardas  
Melissa Karper  
Erin Kemp  
Angelina Kennedy  
Mary Kerns  
Tina Kitchen  
Joseph Kopicki  
Debra Korb  
Tom Korb  
Ahana Kowdley  
Sandra Krauer  
Joyce Kucharski  
Akina Kuperus  
Alan Lake  
Jeanne Lambdin  
Julia Larsen  
Katie Leatherman  
Sihyun Lee  
Mike Lee  
Joshua Levenstein  
Suzi Levin  
Brooke Lewellyn  
Caleb Lewellyn  
Sharon Lewis  
Lakia Lewis  
Marie Lilly  
Emily Lima  
Jessica Lipton  
Donna Lloyd  
Elias Logan  
Katie Loukota  
Kathryn Lowe  
Erin Luck  
Katherine Lynn  
Cassi Lyon  
Anna Magnaterra  
Gail Mahan  
Sara Mahmood  
Keeley Mahoney  
Kristen Mankowski  
Kelly Martin  
Amy Maschal  
Heather McAleer  
Sean McAllister  
Aly McCue

Linda McIvor  
Peg McKibbin  
Wesley Mericle  
Marsha Meyd  
DeAnna Miles Brown  
Mary Miller  
Mel Miller  
Jacob Miller  
Candice Mitchell  
Angie Mogensen  
Lindsey Mohler Coleman  
William Monk  
Joan Montanari  
Courtney Mooney  
Alice Moore  
Callie Morgan  
Alicia Morgan  
Mariah Morris  
Lauren Mueller  
Susan Mullikin  
Frances Murphy  
Emily Myers  
Kathleen Naughton  
Broadus Nesbitt III  
Brenda Nickerson  
Dan Noppenberger  
Claire Noppenberger  
Jeremiah Olson  
Lindsay Orellana  
Connor Oswald  
Rachel Paillet  
Danielle Painter  
Aisha Palmer  
Jongsub-Jay Park  
Athena Park  
Skye Park  
Sandra Parobeck  
Dara Pasquali  
Elizabeth Peace  
Derek Peoples  
Alden Peoples  
Naomi Peppers  
Brianna Perea  
Carrie Perkins  
Anna Perry  
Rob Peters  
Gwendolyn Phillips  
Abigail Piegols  
Vladimir Pipko

Susan Poage  
Kellie Podsednik  
Sam Pogar  
Sabryn Porreca  
Ellen Powell  
Mansur President  
David Pugh  
Elias Ramos  
Andrew Rampolla  
Allure Ramsey  
Samantha Reich  
Lindsay Reich  
Amy Resnik  
Jenna Resnik  
Sean Reynolds  
Jessica Rich  
Stephen Ricketts  
Kelly-Anne Riess  
Lea Ritson  
Mark Roberts  
Adonna Robinson  
Kia Rogers  
Claudia Romeo  
Annette Romero  
Mary Rosekrans  
Charles Ross  
Jessica Ross  
David Ruane  
Angela Rudacille  
Iris Rudman  
Paul Rudman  
Kaydee Ruzsala  
Hope Sacco  
Lee Ann Salter  
Isabela Sampaio Gondim  
Shannon Sanborn  
Sheri Sanford  
Gloria Santamaria  
Lauren Santos  
Alexandra Santos  
Eduardo Santos  
Robert Sawyer  
Abigail Schadegg  
Linda Schneider  
Ashley Schoen  
David Schroeder  
Catherine Schroeder  
Eric Scott  
Alexandra Seidman

Paula Shevitz  
Cecile Shindell  
Nicole Simke  
Sylvia Simke  
Victoria Simonetti  
Kira Skelly  
Allison Smith  
Evan Snyder  
Ambar Solis  
Anthony South  
Peggy Spangler  
Donovan Spedden  
Angela Spencer  
Ethan Stafford  
Kelly Stafford  
Arthur Starr  
Betty Stehman  
Michael Stein  
Darryl Stephens  
Dwight Stone  
Helen Streimer  
Carol Sullivan  
Leeann Summerlin  
Anushka Suresh  
Mason Surhoff  
Robert Swain  
Darlene Szczepanik  
Lauren Taylor  
Jaclyn Tekiela  
Natalie Telfor  
Merhawit Tesfay  
William Thomas  
Jennifer Thomas  
Claire Thomas  
Krystle Thomas  
Michele Tornabene  
Emily Trotter  
Adam Uslan  
Robert Valentin  
David Var  
Anand Venkataraman  
Niki Verrier  
Theo Walcott  
Melissa Wallace  
Xiaoyan Wang  
Ellison Warmath  
Susan Waxter  
Delaney Webb  
Laura Webb  
Autumn Weber

Brittany Weicht  
Susan Weil  
Michele Weiss  
Tyler Wells  
Kristen Wheeler  
Jason Whiting  
Breana Wilde  
La Monte Williams  
Billy Williams  
Michal Williams  
Dianne Williams  
Jennifer Wilson  
Brittany Wilson  
Brooke Wingate  
Dave Wollner  
Sue Wollner  
Simon Wong  
Brittany Woodward  
Debbie Woolley  
Mike Woolley  
Derek Wu  
Lisa Yarmis  
Hang Yin  
Cathy Young  
Beco Zekic

#### **SERVICE GROUPS**

90 Cyber Protection Team - Navy  
Adams Funds  
Agora  
Alight Solutions  
Americorps National Civilian  
Community Corps  
Baltimore City Association of  
School Psychologists  
Bel Air High School  
Centerplate  
Ellin & Tucker, Chartered  
Exponential Interactive  
Boy Scouts of America-  
Fred Kaak Eagle Project  
Grant Thornton LLP  
Harford Community College  
Johns Hopkins Alpha Phi Omega  
Johns Hopkins Circle K Club  
M&T Bank  
Gunpowder State Park Maryland  
Conservation Corps  
Maryland Department of Health  
Maryland Department of Labor

McDaniel College- Honors Program  
Morgan Stanley  
Navy Information Operations  
Command Maryland  
Nielsen  
North Harford Middle School  
Peer Group  
Northrop Grumman  
Outward Bound  
Paypal Credit  
Price Waterhouse Coopers  
Ruppert Landscape  
Stevenson University Paws Club  
Susquehanna State Park Maryland  
Conservation Corps  
The Baldwin School  
The Vaper'sKnoll  
Towson Club Softball  
Towson National Association Black  
Accountants  
Towson Pre Med Club  
Towson Pre Physical Therapy Club  
Towson Public Relations Group  
Towson Sisterhood  
Towson Unite  
Towson University Alpha Phi Omega  
(APO)  
Towson University Beta Alpha Psi  
Towson University Circle K  
Towson University Latin American  
Student Organization  
Towson University Optimist Club  
Towson University Phi Sigma Pi  
Towson University Society of  
Accountancy  
Towson University Student  
Government Association  
Towson University Students  
Towson University Alpha Kappa Alpha  
UMBC- Alpha Phi Omega

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The Maryland Zoo in Baltimore is a non-profit organization accredited by the Association of Zoos and Aquariums.



# MARYLAND ZOO

1876 Mansion House Drive, Druid Hill Park, Baltimore, MD 21217-4474

[www.marylandzoo.org](http://www.marylandzoo.org)

## HOURS OF OPERATION

Every day is a great day to be at the Zoo! Plan ahead and enjoy a day here soon. Before you visit, check the Zoo's website – [www.MarylandZoo.org](http://www.MarylandZoo.org) – to get up-to-date information on daily programming, exhibits, and upcoming events.

Open daily, 10 a.m. – 4 p.m.

*(Closed Thanksgiving Day and December 25, and Tuesday through Thursday in January and February.)*

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General Information	410-396-7102
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Education	443-552-5300
Group Sales	443-552-5277
Membership	443-552-5281
Corporate Membership	443-552-5270
Adopt	443-552-5281
Rentals	443-552-5277
Volunteers	443-552-5266