

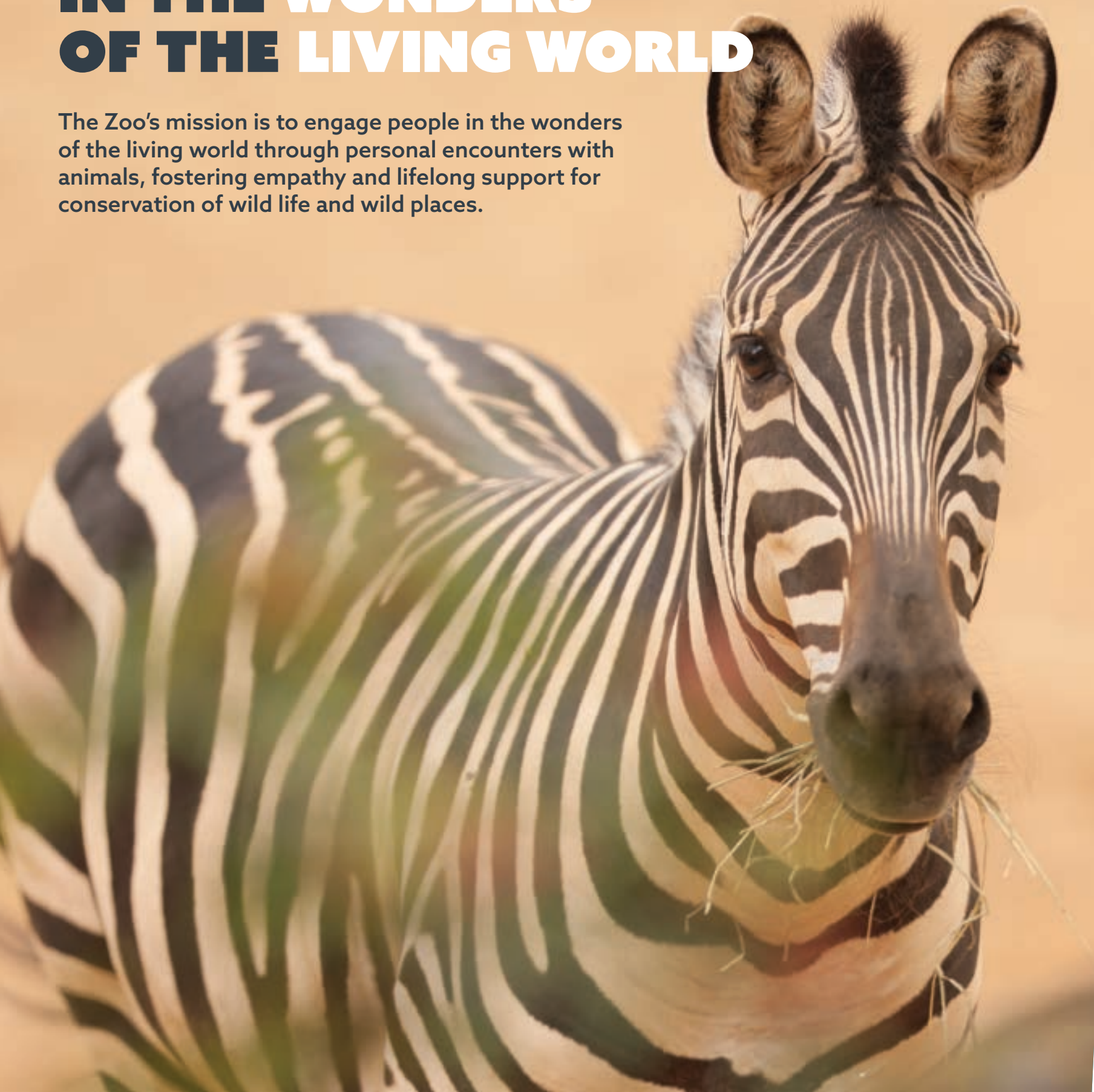


ANNUAL REPORT

Fiscal year 2022

ENGAGING PEOPLE IN THE WONDERS OF THE LIVING WORLD

The Zoo's mission is to engage people in the wonders of the living world through personal encounters with animals, fostering empathy and lifelong support for conservation of wild life and wild places.



Two years ago, in 2020, our Zoo was busy responding to the external challenges forced on the world by COVID-19. This past year, we proved equally adept at managing internal change.

Most noticeably, we reopened Main Valley with a new path and painstaking restorations of the historic Crane Barn, former Elephant House, and Round Stand. This area, which had been closed to the public since 2004 and no longer features animal exhibits, was reinvented as a walking tour through Zoo history.

Diesel guest shuttles were replaced by a new fleet of energy-efficient electric trams. Other sustainability initiatives included a review of our water usage, updated recycling and compost efforts, the elimination of single-use plastics, and work on a Sustainability Plan to be unveiled in the new year.

To be as welcoming and inclusive as possible, we launched important initiatives in support of Diversity, Equity, Accessibility, and Inclusion (DEAI), such as creating an Employee Resource Group and renewing our KultureCity training to assist our guests with sensory needs, such as PTSD and autism. We also adopted a new compensation plan for FY22 that raised all starting hourly salaries to \$15, three years ahead of the State mandate. In addition, existing front-line hourly employees, including most of our animal care team, received pay increases between 18 and 27 percent.

Fiscally, we had a very strong year thanks to new ticket pricing, grant and sponsorship funding, and the award-winning DINOSAURS exhibit that brought in extra revenue this spring through the fall. We stepped up fundraising for conservation projects and were able to make significant contributions to our partners in the field, including Elephants for Africa in Botswana and the El Valle Amphibian Conservation Center in Panama.

Because we're proud of our success in 2022, we launched a new brand awareness campaign, *You've Got Wild Neighbors*, and told our story through the press, earning international coverage from Albany to Australia.

As the fiscal year ended, the Zoo's Board of Trustees, staff, volunteers, and a top-flight consultant were wrapping up work on the Zoo's strategic Master Plan (subsequently released in FY 2023). This forward-looking document will guide the improvements our Zoo community wants to see happen over the next decade, and make us more resilient when faced with unanticipated challenges.

We hope you enjoy reading about these successes, and more, over the past year, and thank you for being part of the change you want to see at the Maryland Zoo.



Michael Aldrich
*Chair, Maryland Zoological
Society Board of Trustees*

J. Kirby Fowler, Jr.
President & CEO

HABITAT RESTORATION

Zoo staff and teen volunteers who serve on the Community Conservation Action Team completed multiple trash cleanups in Druid Hill Park and at the Anita C. Leight Estuary Center at the Otter Point Creek Natural Area in Harford County.



57,503 STUDENTS
enjoyed
FIELD TRIPS
(in-person + virtual)



428,764
VISITORS

EASTERN BOX TURTLE STUDY

Zoo staff and Teen Conservation Volunteers who are trained as research leads tracked and monitored Eastern box turtles living on Zoo grounds to assess movement, habitat usage, and nesting activity.



WOOD TURTLE HEADSTART PROJECT

Zoo staff conducted health assessments, performed disease screenings, released the first head-started juvenile, and began tracking five wild wood turtles in western Maryland as part of an ongoing Wood Turtle Headstart Project in partnership with the Maryland Department of Natural Resources.



100,000+ MEALWORMS
bred by Commissary team
for inclusion in animal diets



731 VOLUNTEERS
gave
22,878 HOURS
of service,
UP 40%
from FY21



PROJECT SNOWSTORM

Hospital staff processed samples taken from 10 wild snowy owls wintering in the lower 48 states, maintained Project SNOWstorm's biobank, and cared for an injured wild snowy.

4 STAFF gave **380 MANHOURS**
in response to
3 OILED WILDLIFE EMERGENCIES



450 EXAMINATIONS
by staff veterinarians of
Zoo animals, including
146 ANESTHETIC PROCEDURES



BIRD CARE

In February 2022, Curator of Birds Jen Kottyan and Associate Veterinarian Andrea Aplasca got news they were anticipating but hoping to avoid. They did not flinch; they just kicked into gear. A deadly strain of Highly Pathogenic Avian Influenza (HPAI), also known as “bird flu,” was moving up the Atlantic Flyway—spread by wild, migrating birds—and the first cases had just been reported in Maryland. Kottyan and Aplasca activated a detailed, four-tiered response plan that had been years in the making. Zoo birds that were most likely to come in contact with wild, migrating birds moved indoors. Keeper teams in designated areas cared for them behind the scenes. As a precautionary measure, the Zoo also closed its aviaries to guest foot traffic. For the next several months, Kottyan and Aplasca put in long hours managing the Zoo’s response to this latest health crisis, and the plan worked flawlessly. The birds got exactly the care they needed, remained safe and healthy, and moved back outdoors once appropriate precautionary measures had been taken to modify their exhibits and the risk of infection had lessened.



CARE

Care is central to our mission and our culture.

This was a year to take a collective deep breath and get back to some degree of normal. COVID did not disappear from our lives or operations, and we continued to take great care to keep staff, volunteers, guests, and animals safe. This was a year to recharge, though, and look to the future.

Every year, no matter what, we prioritize the welfare of animals in residence at the Zoo. In FY22, that translated into more than 135,000 hours devoted by keepers, managers, veterinarians, and veterinary technicians to animal care. How is such time spent? On everything you can possibly imagine and many things you can’t, from prepping diets and improving habitats, to training animals to participate in their own medical care, to managing 18 different breeding programs. Most notably, time spent caring for animals is time spent responding to whatever transpires daily in the individual lives of more than 2,000 complex, unique, and remarkable beings. It requires endless passion, skill, dedication, and flexibility, and our animal care staff delivers without fail.

This was also a year to provide an extra dose of care to our staff, all of whom rose to pandemic-level challenges with heroic dedication and unyielding determination. The Zoo adopted a new compensation plan in FY22 that raises staff salaries, increases pay for most hourly employees by 18 to 27%, and institutes a \$15 minimum wage three years ahead of the State mandate. Additionally, Zoo President Kirby Fowler approved year-end bonuses in 2021 for all staff.

Caring for staff and volunteers also means fostering a culture of diversity and inclusion at the Zoo. Just as we encourage respect and appreciation for all species of life, so too do we encourage respect and inclusion of people of all backgrounds on our team. In FY22, the Zoo formalized its commitment to diversity, equity, accessibility, and inclusion by hiring its first DEAI manager.

We extended care as well to people in our neighborhood and colleagues across the world still confronting tremendous challenge. The Zoo provided 80 complimentary tickets to Afghan refugees newly arrived in Baltimore, to welcome them to our community. The Zoo also donated \$2,000 in support of colleagues in Ukrainian zoos who remain dedicated to their work and their animals even while under wartime siege. The money was distributed through the European Association of Zoos and Aquaria (EAZA), which is coordinating relief efforts.



GROW UP GREAT

There are thousands of eager, enthusiastic, passionate young learners across the state of Maryland who would love to visit the Zoo but, for one reason or another, can't. So, we do our best to bring the Zoo to them through engagements on our website, social media, virtual programming, and by other creative means. Since 2010, for example, with support from the PNC Foundation's Grow up Great initiative, Zoo educators have connected with early learning classrooms on the Eastern Shore. This year, we delivered Grow up Great activity kits to preschoolers that contained animal storybooks, magnifying glasses, binoculars, a vet kit, and an outdoor bug kit, among other fun items. "We love our kits so much that we are planning Nature Walk Wednesdays here at school," wrote one teacher. "We would love to come visit the Zoo," she went on to say, "but we are having trouble getting charter buses to take us that far. One day we will make it work! This is an amazing partnership and we are so happy to be part of it!"

ENGAGEMENT

Engagement is a path to shared learning.

Some of the best conversations that we have with visitors to the Zoo start small. A Visitor Services agent might ask how your day is going, or a Volunteer might point you toward the elephants, or a child might ask our Naturalist why he's poking around in the leaf litter. These small moments make a big difference, though, in helping visitors feel welcome, comfortable, and curious.

Engaging people in conversation is one of the most important things that we do. It's a two-way street, a dialogue, an interactive experience that puts us on a shared path with our guests to learning and caring about wildlife and the natural world. In FY22, the Zoo's Education and Volunteers departments reorganized into the Learning and Community Engagement (LCE) team. The exercise was not merely one of semantics but of acknowledgement that fulfilling the Zoo's mission—to inspire people to take action to save wildlife and wild places—begins with engagement, both at the Zoo and in the community.

Thankfully, FY22 was a year to engage once more in person. We were able to resume many popular activities on grounds, including Keeper Chats, Animal Ambassador stations, and daily activities at the Naturalist Lodge. Field trips resumed as well, and we were thrilled to host more than 10,000 students and teachers on grounds. Zoo educators and animal care staff partnered on up-close animal experiences that

allow guests to get closer to their favorite animals. LCE, Animal, and Events staff also worked together to host a robust season of Zoo Snooze Overnights, Twilight Family Strolls, Sip & Strolls, and Breakfasts with the Animals; six weeks of summer camp; and a Keeper-in-Training program for middle and high school students. Every one of these offerings sold out! We also onboarded 39 new teen volunteers this year and brought long-serving volunteers back into more varied and interactive service.

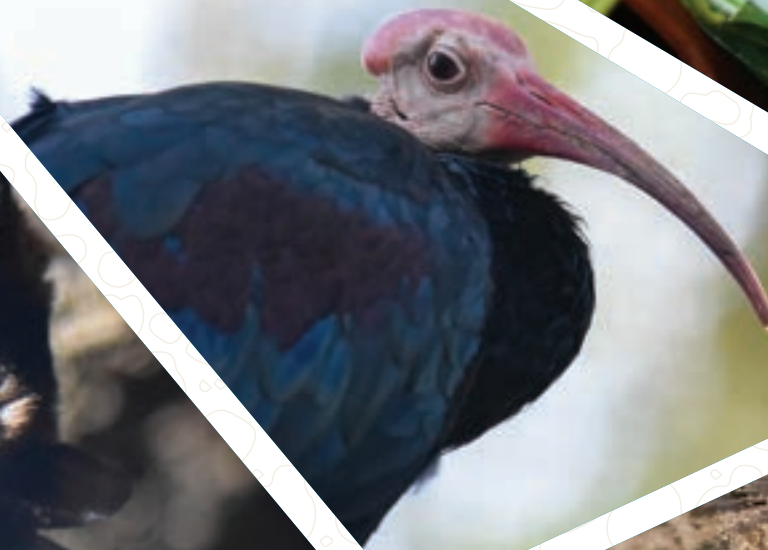
We were out in the community as well, engaging with the public in habitat cleanups, local conservation work, and neighborhood sustainability projects. Zoo Naturalist Peter Martin led monthly bird walks in Druid Hill Park and participated in numerous community science projects on behalf of the Zoo. He collected data for the Maryland/DC Breeding Bird Atlas, participated in four Christmas Bird Counts for the National Audubon Society, ran two breeding bird surveys, and lent his insect expertise to the Masonville Cove Bioblitz in July 2021.

Meanwhile, with the launch of a new awareness campaign, our Marketing team reminded everyone in and around Baltimore to stop by Druid Hill Park—only a hop, skip, and step away—to meet their wild neighbors. A creative shoutout to the furred and feathered, *You've Got Wild Neighbors* was broadcast through video, print, and digital assets to engage the imagination and encourage visitation.

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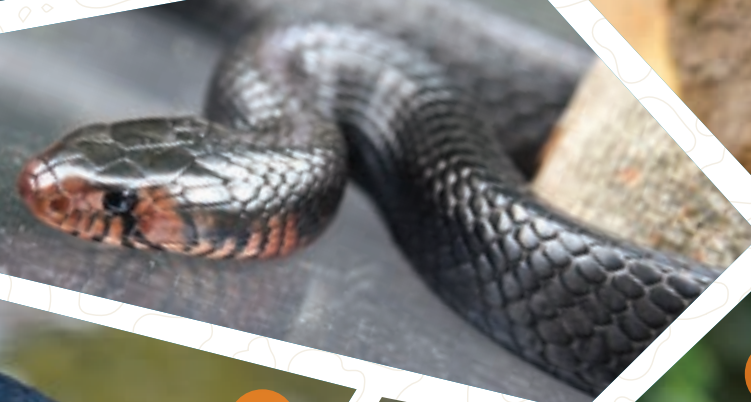
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10



11



12



13



- 1. 150 Seba's short-tailed bats
- 2. One southern bald ibis
- 3. Panamanian golden froglets (too many to count!)
- 4. One indigo snake
- 5. One tawny frogmouth
- 6. One lapwing
- 7. One hooded merganser
- 8. Twelve African penguin chicks hatched
- 9. Two white-tailed skink
- 10. Two white-faced whistling ducks
- 11. One wood duck
- 13. One sitatunga

NEW TO THE ZOO

A young swamp antelope, a rare African ibis, a dozen fuzzy penguin chicks, and a bevy of bats joined our animal family this year. And that's not all! Take a look at who was new to the Zoo in FY 22, either by birth, hatching, or acquisition.

GEO-TRACKING AFRICAN ELEPHANTS

Botswana is home to more African elephants than any other country in the world. Dr. Kate Evans aims to protect those elephants while also helping local people co-exist with them. For the past 15 years, she has been studying the complex social lives and ecological needs of male elephants in Botswana. She is founder and director of Elephants for Africa (EfA), a longtime conservation partner of the Maryland Zoo. This year, the Zoo secured a \$50,000 donation for EfA that will help Dr. Evans and her team launch a study of elephant movement patterns. Ten bull elephants have been fitted with radio collars and will be tracked over three years to assess their land use. By understanding where male elephants are moving and why, Dr. Evans will gain valuable insight that government agencies and NGOs can use to better balance the needs of elephants and people living in close proximity. This is important work that the Zoo is proud to support with its most meaningful conservation contribution to date. It also exemplifies how the Zoo extends its conservation efforts globally by partnering locally.



CONSERVATION

Conservation extends our commitment to wildlife and wild places.

The Zoo's conservation work on behalf of wildlife and wild places moved back into the field in FY22, across the state of Maryland and around the world. While reengaging with colleagues in person, we also continued to work from the Zoo to provide scientific, strategic, and financial support to partners and projects near and far.

Led by Kevin Barrett, Curator of Reptiles and Amphibians, staff made two trips to Panama in FY22 to connect with Panamanian colleagues at the El Valle Amphibian Conservation Center (EVACC). We assisted with field surveys and exhibit improvements at EVACC, where local conservationists are working to establish assurance colonies of critically endangered native amphibians, including the Panamanian golden frog. In addition to hands-on help, the Zoo provided EVACC with \$14,000 of funding and solicited additional support from 18 other AZA-accredited organizations.

In April 2022, Jess Phillips, Area Manager of Penguin Coast, traveled to Namibia and South Africa to participate in a planning conference for the first-ever Namibian Seabird Conservation Center (NAMCOB). As coordinator of the AZA SAFE African Penguin Disaster Preparedness, Response and Rehabilitation Program, Phillips has been instrumental in advancing this crucial and complex undertaking. Working with multiple local government partners and NGOs, Phillips and his SAFE team are guaranteeing the facilities, equipment, staff, and training needed to protect African penguin colonies in Namibia. The Zoo supports Phillips' work financially and in-kind, providing extra financial resources in FY22 for this project.

This past fiscal year, the Zoo also deployed four staff members, who are specially trained and HAZWOPER-certified, to three separate oil spills along the East Coast to assist with wildlife rescue. Zoo staff helped triage, stabilize, clean, and care for birds and other wildlife that were oiled, providing more than 380 hours of manpower to rescue efforts coordinated by Tri-State Bird Rescue & Research. The Zoo has a longstanding relationship with Tri-State and belongs to its mid-Atlantic network of wildlife responders.

SUSTAINABILITY

Sustainability is promise put into practice.

Sustainability means greening our buildings, business practices, and lifestyle choices to benefit the environment. Sustainability also means greening our communities to benefit society. The Zoo is committed to advancing sustainability on both fronts.

We spent much of FY22 developing a comprehensive sustainability plan, soon to be released, that provides measurable targets for waste reduction, resource management, and energy conservation in our buildings, operations, and supply chains. As this year's actions demonstrate, we are already well on our way to meeting those targets.

We took a major step toward reducing our carbon footprint by going all-electric with our guest trams and custodial truck. The three new trams alone will save upwards of \$30,000 in annual diesel fuel costs and reduce carbon dioxide emissions by approximately 286 kg per day. They were purchased with grant funding from the Maryland Department of the Environment's EPA Diesel Emissions Reduction Act (DERA). We also instituted a no-idle policy for staff vehicles, which is a win-win for the environment and everyone's respiratory health, including resident animals.

Gardening is another way that we reduce our carbon footprint while saving money. Every pound of food that we grow on grounds is one pound less that needs to be packaged and shipped to the Zoo. Teen volunteers worked alongside Zoo staff to cultivate the ever-expanding Sustainability Garden, which produces fresh food for inclusion in animal diets, as well as a newly-installed Pollinator Garden in the Main Valley and a Browse Garden that will supply fresh leaf-cuttings. We turn produce scraps into compost that enriches all of our garden beds.

Meanwhile, our intrepid and seemingly tireless Teen Volunteers expanded their good work beyond the Zoo and into neighboring communities, where their green thumbs improved upon green spaces that all can enjoy. Led by Zoo Naturalist Peter Martin and Volunteer Manager Emily Cross-Barnet, the teens helped maintain gardens at Patterson Park and Sisson Street Community Park; built a Nature Play Space at Winan's Meadow; and participated in a day-long BioBlitz at Masonville Cove, an urban wildlife refuge in south Baltimore.

TREE SURVEY

Trees are champions of sustainability. They are irreplaceable allies in the quest to slow climate change, improve the environment, and enhance quality of life. Trees remove carbon dioxide from the air, store carbon, and release oxygen. They filter pollutants and prevent soil erosion. They bring down the heat, bring down our blood pressure, and bring out the birdsong. The Maryland Zoo has approximately 3,500 trees on its campus and in FY22, we invested in each and every one of them. We contracted with Davey Resource Group to send in a team of highly trained urban foresters to survey the Zoo's trees. Over the course of a few months, the foresters geo-located, measured, identified, visually examined, tagged, and risk-assessed every single tree. The survey provides the Zoo with a comprehensive portrait of the health of its trees and a valuable management plan to guide future arbor care.



0 PLASTIC BOTTLES
sold at Zoo
since July 2021

57 POUNDS
of vegetables
HARVESTED
from Sustainability
Garden in summer
2021

7,000 pieces of paper
SAVED
in first half of 2022 by
PAPERLESS-
TRENDING
in Finance Department

100%
ELECTRIC
VEHICLES
featured at
Trucks for Tots

4-YEAR WIN
STREAK for
Zoo team in the July
PLASTIC FREE
Eco-Challenge in
North America

CRANE BARN

About a century ago, a small building went up in the Main Valley of the Maryland Zoo. With its gable roof, dormer windows, and weathervane-crested cupola, it resembled some sort of charming rural cottage. In fact, it was a stable for many surprisingly large animals, including camels, zebra, eland, and lechwe. In time, its residents shifted from hooved to feathered, and the building became known as the Crane Barn. It has been continuously occupied all of its architectural existence, but in FY22, it got a new lease on life. Raised seven inches off the ground to prevent future flooding, it has been outfitted with a new bathroom, kitchen, and animal holding areas, as well as a new roof. New plumbing was installed beneath the floorboards, and the heating, ventilation, and disinfection systems were all updated. Cranes and other birds will enjoy this winter's stay in the reinvented barn, and keepers have improved facilities at their disposal. The Zoo partnered with AZOLA to complete the renovation and is grateful to the State of Maryland for providing the necessary funding.



REINVENTION

Build on the past and look to the future.

Wander the footpaths of the Maryland Zoo and you will pass an ornate fountain that predates indoor plumbing, iron lions cast more than a century ago, and a pavilion once used as a hitching post for horses. Allusions to the past adorn our campus; we blend old with new to create a unique aesthetic.

This past fiscal year, though, we reinvented the meaning of throwback. We stepped back millions of years into the forest and brought forth dinosaurs! Twenty-eight giant animatronic dinosaurs roared to life in the Maryland Wilderness, delighting Zoo visitors of all ages. Open for the last two months of the fiscal year, the exhibit created by Dino Don Inc., one of the world's leading makers of life-size, robotic dinosaurs, attracted approximately 40,000 visitors and garnered nearly \$100,000 in additional revenue for the Zoo.

Our foray into the dinosaur age is just one example of a creative willingness to re-shape people's expectations of the Zoo, keep the guest experience fresh and interesting, and generate new revenue streams. We also reopened the Main Valley this year, a beloved section of the Zoo that had been closed to the public since 2004. It no longer features animal exhibits but has been reinvented as a walking tour of Zoo history. For many in Baltimore, it has been a trip down memory lane that engenders nostalgia, goodwill, and a desire to visit again and again.

By the end of FY22, we were putting the finishing touches on a comprehensive new strategic Master Plan that was released in August 2022. It marks the culmination of an inclusive, multi-year process that establishes a clear vision for the Zoo's future and will guide the institution's growth into the next decade and beyond.

Reinvention is a constant work in progress.

1. DINOSAURS, a Dino Don production in *Maryland Wilderness*
2. Renovated "island" feature in the Giraffe House
3. Main Valley opens to the public for the first time since 2004
4. *Polar Bear Watch* becomes *Northern Passage*.



FINANCIALS

SUPPORT AND REVENUE

CONTRIBUTED INCOME

State of Maryland	\$5,639,221
Federal Government	1,993,600
City of Baltimore	1,658,400
County Grants	431,623
Foundation Grants	321,698
General Support	
<i>Annual Fund</i>	709,020
<i>Corporate</i>	401,248
<i>Other</i>	<u>281,401</u>

Contributed Income 11,436,211

EARNED INCOME

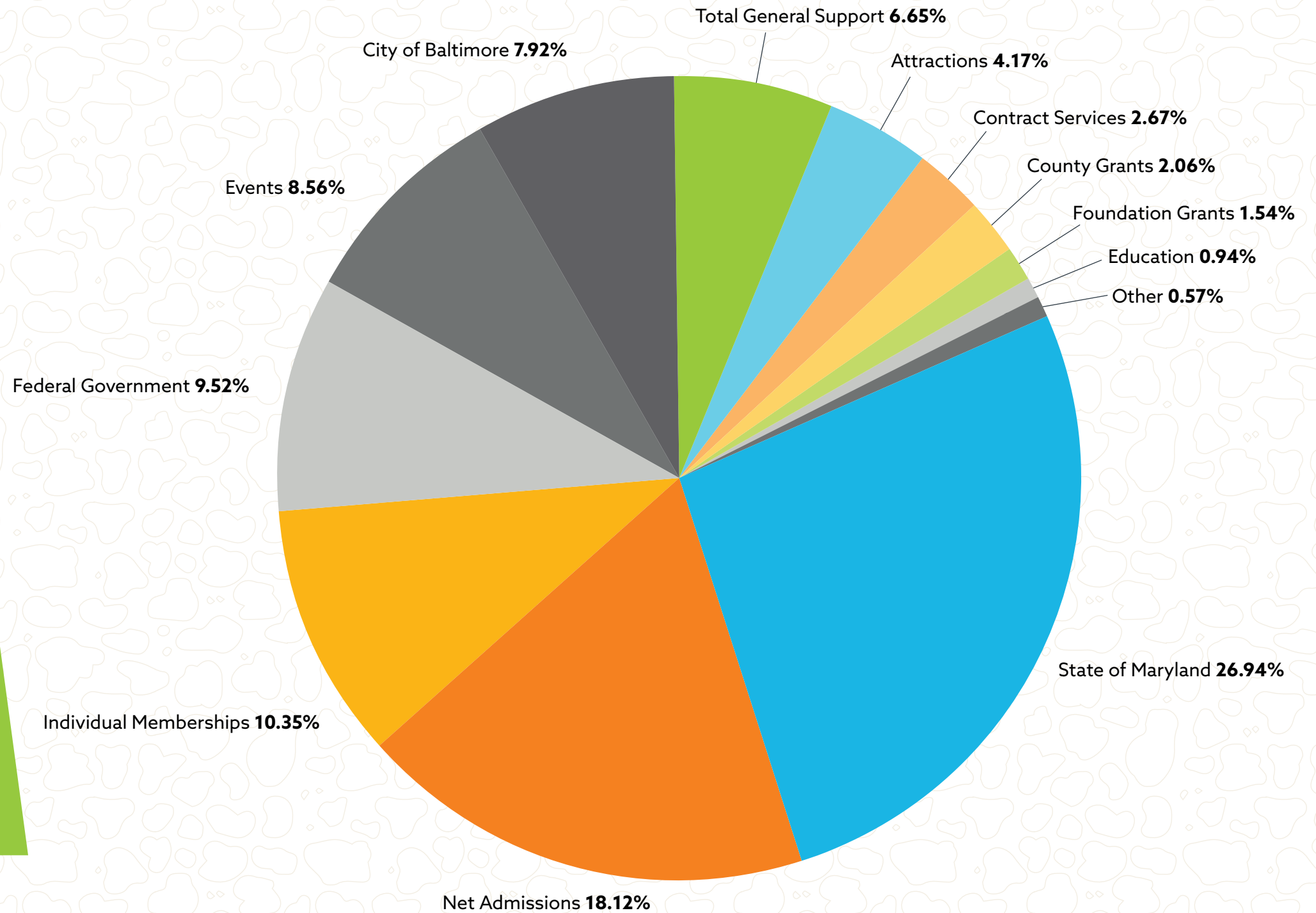
Net Admissions	\$3,792,367
Individual Memberships	2,166,450
Events	1,792,571
Attractions	872,145
Contract Services	559,141
Education	195,804
Other	<u>119,748</u>

Earned Income 9,498,226

Operating Revenues **\$20,934,437**

Net Capital Support (used to fund capital projects) **\$1,258,045**

Total Revenue: \$20,934,437



FINANCIALS

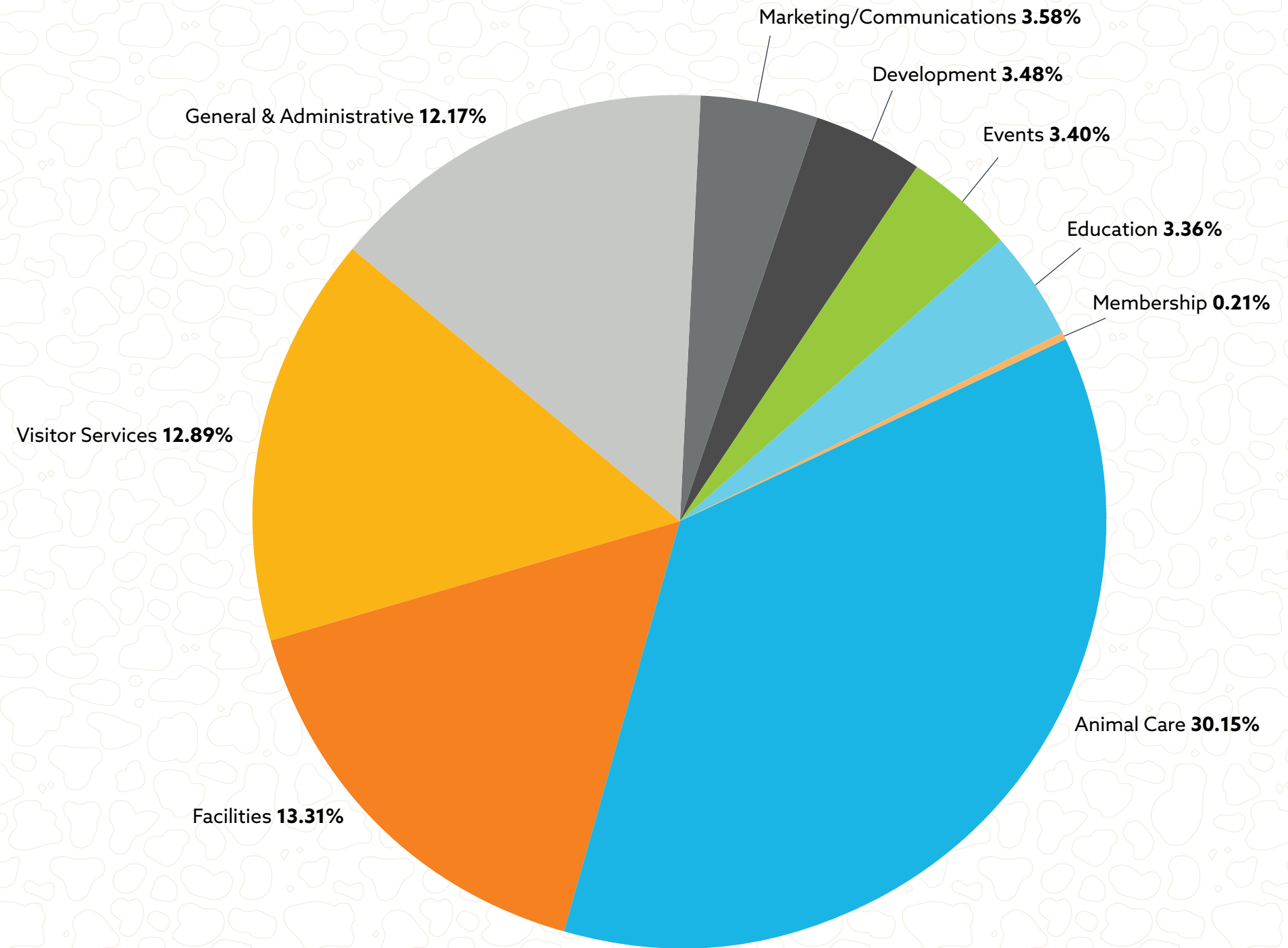
EXPENSES

Animal Care	\$6,936,796
Facilities	3,062,161
General & Administrative	2,799,249
Visitor Services	2,964,860
Marketing/Communications	822,959
Events	782,913
Education	773,554
Development	800,874
Membership	<u>48,305</u>

**Operating Expenses
Before Depreciation** **\$18,991,671**

Note: Depreciation **\$4,015,108**

Total Expenses: \$18,991,671



RESEARCH & PUBLICATIONS

Scientific endeavors are essential to understanding and providing for the species in our care and to advancing wildlife conservation. Scientific knowledge that can be gained in a zoo setting is unique and important. The Zoo actively acquires and shares knowledge through its contributions to research studies, scientific literature, professional groups, and peer gatherings.

RESEARCH

The Zoo is currently participating in several dozen ongoing research studies. Outcomes of these studies can have far-reaching consequences for the improved welfare and protection of zoo animals, their wild counterparts, ecosystems around the globe, and humanity. Study participation must first be approved by the Zoo's Research Committee, which is comprised of Zoo staff and outside researchers. The committee reviews internal and external proposals to insure that proposed projects are safe, will not negatively impact the animals, can be performed in a timely manner, and have scientific merit. Select projects are described below.

SELECT RESEARCH PROJECTS: IN-HOUSE LED

Air sampling for fungal loads in-and-around the Maryland Zoo African penguin enclosures; Jenny Brubaker, Ellen Bronson

The Zoo's four veterinary technicians sampled the air quality at Penguin Coast and Penguin Encounters monthly during FY22 to assess the presence of fungal organisms. Penguins are uniquely sensitive to a fungus called Aspergillus, and understanding changes based on season, temperature, rainfall, and building engineering is vital to keeping the colony healthy.

Movement and nest site selection of free-range Eastern box turtles found at the Maryland Zoo in Baltimore; Katharine Mantzouris, Kevin Barrett, Ellen Bronson

There is a healthy population of Eastern box turtles in-and-around the Zoo that has been monitored for the last 20+ years. Although we have collected a large amount of data during that time, we know little about the true numbers and density in the zoo, their nesting sites, and their movements in both the developed and more wooded areas of the Zoo. Through structured field surveys and tracking via radio-transmitters, this project aims to answer many of these questions. Zoo staff and teen volunteers are participating in this ongoing research project.

SARS CoV-2 vaccination response trial in non-domestic felids; Ellen Bronson

As the SARS CoV-2 pandemic remains prevalent across the world, cases of the virus in non-domestic felids in human care continue to be reported, indicating a unique susceptibility of these species to the virus that is not yet fully understood. In 2021, a Zoetis vaccine developed for American mink was made available to zoological facilities across North America for experimental use in susceptible animal species, including felids. While the type of vaccine developed is generally safe and can be effective across species, there is currently no information regarding safety or efficacy for this SARS-CoV-2 vaccine in non-domestic felid species. Blood samples taken at specific time points were requested from the Felid Taxon Advisory Group from all AZA institutions vaccinating their non-domestic cats. Samples are being shipped to the Maryland Zoo for storage in the Zoo's biobank before being sent to a laboratory for examination of the presence of antibodies to assess the immune response to vaccination. Cats at the Maryland Zoo, including the Amur leopard and cheetahs, also are contributing to this study by voluntarily participating in blood draws during training sessions.

Assessing vocal behavior of the Panamanian golden frog; Alan Zigler, Kevin Barrett, Ellen Bronson, with Tobias Riede, Midwestern University

Male Panamanian golden frogs engage in energetically demanding vocal routines that may be important to reproductive success, though little is currently known about their calls. To better understand their vocal patterns, we employed sound recording of individual male advertisement calls and acoustic monitoring

of the breeding colony at the Maryland Zoo. The goal was to investigate variability within and among individual frogs as well as daily and seasonal patterns of vocal activity of the colony in order to inform animal husbandry practices to improve breeding success and welfare.

SELECT, SUPPORTED RESEARCH PROJECTS WITH COLLABORATORS

Burr on the Fur; Polar Bears International (PBI) facilitated by Erin Grimm

Zoo staff participated in this research project in conjunction with our conservation partner, PBI. Polar bear field researchers have been searching for a method to attach a tracker to polar bears. Collars, as used in other carnivores, do not work well on polar bears due to the width of their necks and the great weight changes that they undergo seasonally. Working with scientists and inventors at 3M, PBI has been partnering with zoos to try out new tracker tag prototypes on zoo polar bears. When two young female polar bears, Amelia Grey and Neva, were anesthetized at the Maryland Zoo for pre-shipment examination prior to moving to new zoos, we tested one of the 3M prototypes.

Investigating the utility of hair and skin analyses to monitor hormone activity in elephants; Elizabeth Freeman, George Mason University

This pilot study investigates the feasibility of using nail clippings, body and tail hair from the Maryland Zoo elephants to monitor reproductive patterns and animal well-being. Tracking hormone levels is a frequently used tool to support wildlife management. While urine or feces are the standard for monitoring endocrine activity, the use of hair and nails for investigating physiological activity in free-ranging species has been growing. Hair and nails are easy to transport and store long-term and they are not affected by capture stress. Additionally, long hairs or nails can provide a retrospective marker for hormone secretion over weeks or months.

Ophthalmic evaluation and abnormal findings in Panamanian golden frogs; Anthony Lisaskis, Eye Care for Animals

The aim of this prospective study is to assess and characterize the ocular findings and rate of eye disease occurrence in 100 Panamanian golden frogs located at the Maryland Zoo in Baltimore. Additionally, we will collect and compare the values of selected diagnostic tests (bacterial culture, endodontic paper point absorbent test, rebound tonometry, rose bengal stain, and palpebral fissure length) in these same frogs to compare to other frog populations and to establish a baseline for the two populations held at the Maryland Zoo.

Evaluation of antibody testing and biomarkers for aspergillosis in African penguins; Carolyn Cray, University of Miami

The fungal disease aspergillosis remains a difficult infection to diagnose antemortem in avian species. Previously, we have studied plasma from African penguins with and without aspergillosis and identified changes in plasma proteins and other analytes. Blood samples from the Maryland Zoo's African penguin colony collected for other testing and stored in the Zoo's biobank are being used to validate new potential biomarkers and antibody tests in order to improve the early diagnosis of this challenging disease in penguins and to diagnose and treat affected penguins earlier.

PUBLICATIONS

Reidy L, Desoubeaux G, Cardenas J, Seither J, Kahl K, Chauvin D, Adkesson M, Govett P, Aitken-Palmer C, Stadler C, Tociłowski M, Sirpenski G, **Bronson E**, Cray C. Detection of gliotoxin but not bis(methyl)gliotoxin in plasma from birds with confirmed and probable aspergillosis. *J Zoo Wildl Med* 2022;60-69.

Trump K, Sander S, Sander W, Zimmerman D, **Bronson E**. Retrospective study of morbidity and mortality of African penguins (*Spheniscus demersus*) under managed care in North America: 2007-2018. *J Zoo Wildl Med* 2021;1135-1142.

Bronson E, Deem SL, Westermann LCP, Alpire SA, Emmons LH. Field anesthesia in the maned wolf (*Chrysocyon brachyurus*) in Bolivia. *J Wildl Dis* 2021;618-622.

PRESENTATIONS

COVID in the Wild: The Effects of the COVID-19 Pandemic on Felid Species. **Ellen Bronson**. Natural History Society of Maryland. June 2022.

African Penguin Veterinary Advisor Report. **Ellen Bronson**. African penguin Breeding and Transfer Meeting. Cincinnati, OH. June 2022.

Gastrointestinal Disease of Zoo Animals. **Ellen Bronson**. Physiology guest lecture. Midwestern University. Glendale, AZ. May 2022.

Penguin Medicine 101. **Ellen Bronson**. Guest lecture for Wildlife, Exotics, Zoo, Avian, and Aquatics Club. Midwestern University. Glendale, AZ. May 2022.

Being a Veterinarian in Zoo and Conservation Medicine. **Andrea Aplasca**. Guest lecture for Pre-Vet Club. Towson University. Towson, MD. April 2022.

Adventures in Zoo and Conservation Medicine. **Andrea Aplasca**. Guest lecture for Association of Asian Veterinary Medical Professionals (LMU Student Chapter) and Zoo Medicine Club. Lincoln Memorial University College of Veterinary Medicine. Harrogate, TN. April 2022.

Becoming a Veterinarian. **Andrea Aplasca**. Guest presenter and panelist for Virginia-Maryland College of Veterinary Medicine and Maryland Veterinary Medical Association. Blacksburg, VA. April 2022.

Managing Zoo Animal Collections. **Ellen Bronson**. Guest lecture for Health Management of Animal Populations. University of Maryland. College Park, MD. March 2022.

Common Aquatic Parasites. **Andrea Aplasca**. Virtual guest lecture for Aquatic Animal Health and Medicine course. Ohio State University College of Veterinary Medicine. March 2022.

Diseases of captive and free-ranging mammals. **Ellen Bronson**. Virtual guest lecture for Wildlife Diseases undergraduate class. University of Maryland. November 2021.

Preventive medicine of wildlife under human care. Zoo nutrition in wildlife ungulate species. Neonatal care of hoofstock. Wildlife disease and ecosystem health. **Andrea Aplasca**. Virtual guest lecturer for The Wilds Vet Ed online course. October 2021.

Fungal Air Sampling Program at the Maryland Zoo in Baltimore to Monitor Aspergillus Species Exposure in an African Penguin (*Spheniscus demersus*) Colony. **Jenny Brubaker**. Association of Zoo Veterinary Technicians annual conference. Norfolk, VA. October 2021.

Institutional identity through the discourse of zoo professionals: A pilot project. **Sharon Bowen**. Virtual presentation for Association of Zoos and Aquariums (AZA) Annual Conference. September 2021.

AZA and climate: Keeping up with the change. **Jess Phillips**. Virtual panelist for AZA Conference. September 2021.

Pharmacokinetics of single and multidose transdermal itraconazole in the liver and skin of Panamanian golden frogs (*Atelopus zeteki*). **Ellen Bronson**. International Herpetology Society Conference. Virtual/hybrid July 2021.

Planning & Partners: Panamanian Golden Frog Conservation at the Maryland Zoo; **Kevin Barrett**. Chicago Herpetological Society. Virtual July 2021.

PROFESSIONAL AFFILIATIONS AND ACHIEVEMENTS

IN FISCAL YEAR 2022

General Curator and Elephant Program Manager **Mike McClure** led the African Penguin AZA SAFE marine movement tracking program and continued to serve as a Member of the Board of Directors for the Elephant Managers' Association, Course Administrator and Instructor for the AZA Principles of Elephant Management 1 and 2, and Member and Scientific Program Chair for the Elephant Endotheliotropic Herpesvirus Advisory Group.

Dr. Ellen Bronson, Senior Director of Animal Health, Conservation & Research, served as veterinary advisor to the Felid Taxon Advisory Group (TAG), African Penguin Species Survival Plan (SSP) and Taxon Advisory Group, Panamanian Golden Frog SSP, and Project Golden Frog.

Kerrie Kovalski, Vice President of Learning and Community Engagement, served as a member of the AZA Volunteer Management Committee and co-chaired the Host Committee for the AZA Annual Conference.

Curator of Mammals **Erin Grimm** was studbook keeper for the North American giraffe population.

Curator of Birds **Jen Kottyan** was vice-chair of the African Penguin TAG and served on its steering committee as well as on the African Penguin SSP steering and management committees; was vice-chair of the Ciconiiformes/Phoenicopteriformes/Pelecaniformes TAG (Ibis & Stork group) and served on its steering committee; and was program leader and studbook keeper for the North American hamerkop population.

Curator of Reptiles & Amphibians **Kevin Barrett** was the studbook keeper for the North American Panamanian golden frog (PGF) population and co-coordinator of the PGF SSP. He also served on the Amphibian TAG steering committee and as a North American Turtle AZA SAFE program collaborator.

Penguin Coast and Africa Barn Area Manager **Jess Phillips** served as vice-coordinator of the African Penguin AZA SAFE program and coordinator of the African Penguin AZA SAFE disaster preparedness, response, and rehabilitation program. He also became a certified HAZWOPER trainer.

Maryland Wilderness Area Manager **Danielle Regan** was the studbook keeper and SSP coordinator for the North American Egyptian tortoise population. She was also a North American Turtle AZA SAFE program collaborator and served on its Health & Welfare committee.

Chimpanzee Forest Area Manager **Pam Carter** served on the steering committees for the Chimpanzee SSP program and the Chimpanzee AZA SAFE program.

Animal Embassy Area Manager **Jenny Egan** was a general member of the Animal Ambassador Scientific Advisory Group – Sustainable Collections Initiative.

Registrar **Ian Shelley** was the studbook keeper and SSP coordinator for the North American Spotted Whistling Duck population, served on the Anseriformes TAG steering committee, and assisted the Andean Bear AZA SAFE program.

Director of Volunteer Programs **Allison Schwartz** served as president of the Maryland Council for Directors of Volunteer Services (MCDVS) and on the Board and Membership Committee of the Association of Leaders in Volunteer Engagement (ALIVE).

Director of Interpretation and Evaluation **Sharon Bowen** served on the AZA Research & Technology Committee and as an education advisor to the AZA Chimpanzee SAFE Steering Committee.

Director of Education and Volunteer Operations **Hannah Rupert** served on the AZA Diversity Committee.

Conservation Programs Manager **Katharine Mantzouris** received the Nico van Strien Leadership in Conservation Award from the American Association of Zoo Keepers.

GOVERNMENT SUPPORT

Between July 1, 2021 and June 30, 2022

The Maryland Zoo continued to receive invaluable support from the State of Maryland, the City of Baltimore, the citizens of Baltimore County, and the Howard County Arts Council and Howard County Government. Together, these governments provided the base funding of the Zoo's operating budget. The State of Maryland remained the most significant funder of important capital improvements. We remain deeply grateful for government leaders' recognition and appreciation of the Zoo as a high-quality institution serving the community. Foundations also provided funding that was critical to our success during the last year.



THE CITIZENS OF
BALTIMORE COUNTY



Howard County Arts Council through a grant from Howard County Government

ZOO VOLUNTEERS

The Zoo benefits tremendously from the time and talents of its many volunteers. This dedicated corps provides hours of valuable service that enhance Zoo operations at every level and add positively to the guest experience.

500+ Hours

Arlene Falke
Bob Lidston
John Shaffer

400+ Hours

Cindy Bowie

300+ Hours

Suzanne Blair
Larry Martin
Ted Miller

200+Hours

Beth Bishop
Diane Burkorn
Gerald Galuardi
Jeffrey Griffin
Judi Guralnick
Linda Hayes
Bernard Hayes
Lynn Krufft
Susan Landers
Tom Levickas

100+ Hours

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Beth Penn
Nancy Phillips
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Lyn Reeves
Jack Sheehe
Edward Shevitz
Peggy Sullivan
Randy Ash
Dacia Balch
William Brandenburg
Michael Brown
Susan Browning
Lynne Burek
Jeffrey Coleman
Anna DiGennaro
Julia Dimaio
Jim Dobson
Joseph Escobedo
John Eybs

100+ Hours

Michael Fitzpatrick
Linda Forlifer
Poulheria Frankos
Herbert Goldman
Susan Grady
Reilly Grealish
Betty Harris
Joshua Herren
Kathryn Hogue
Kate Jacob
Carol Jones
Alan Katz
Sandra Krauer
Benjamin Lacombe
Jeanne Lambdin
Glenn Lichtman
James Lurz
Hilde Martin
Linda McIvor
Nancy Meier
Nora Miller Smith
Kathleen Monroe

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Susan Moore
Frances Murphy
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Jessica Paffenbarger
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Ellon Ruschell
Sara Service
Patricia Smith
Rhona Sober
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Arlene Ogurick
Ethan Reilly
Donna Scarbrough
Claire Schwartz
Ryan Shaivitz
James Siegert
Anthony South
Angela Spencer
Ezekiel Sulonen
Lynaia Trotter
John Wagener
David Wallace
William Westlake

Carrie Wiskman
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Shariemel Abellanos
Faridatou Adedoyin
Alexis Ainsworth
Victoria Allman
Nur Amalina Amir Hamzah
Jennifer Anderson
Lark Anderson
Nik Andhavarapu
Sarah Arjoon
Ava Bailey
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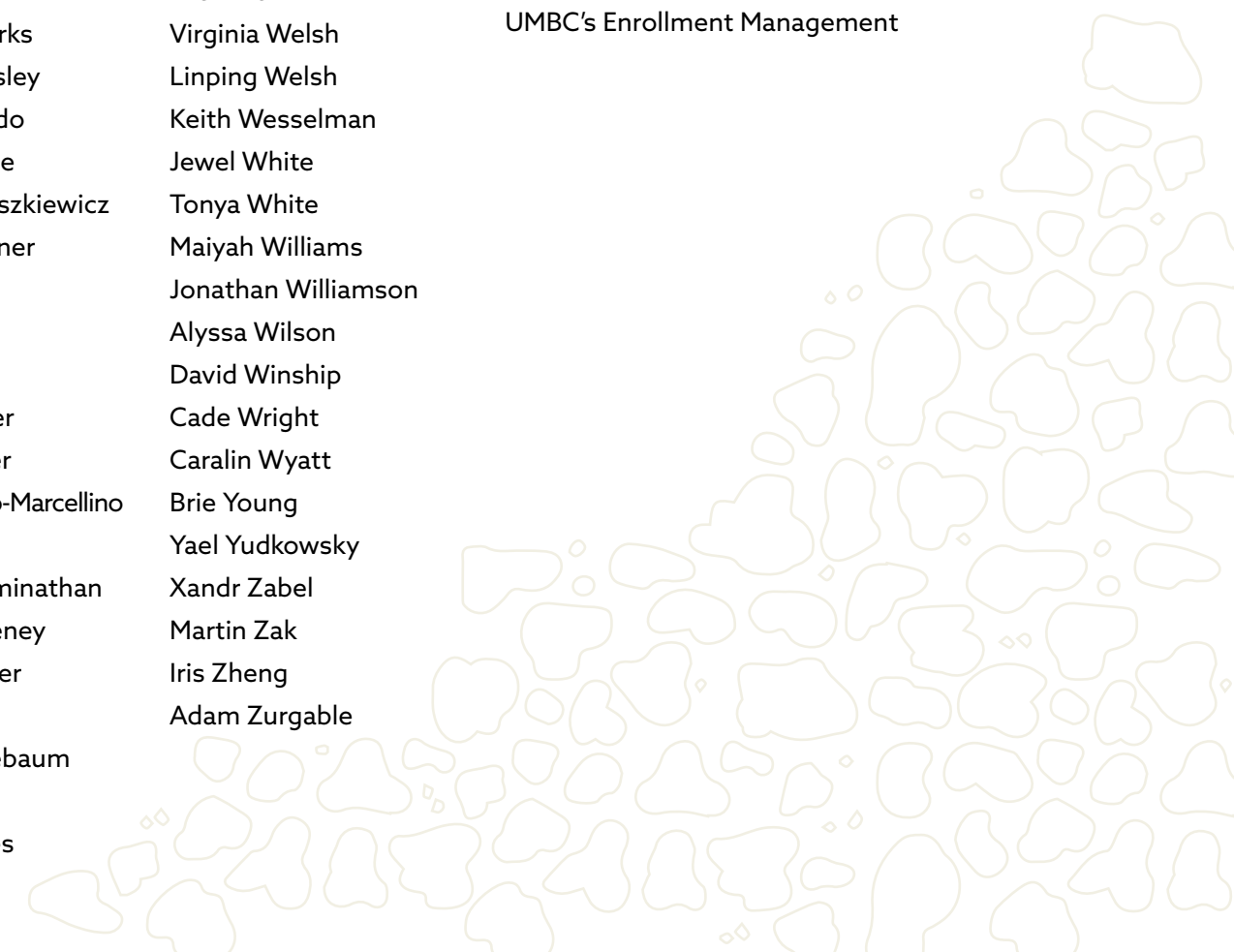
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Century Engineering
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Constellation
Constellation Wholesale Accounting
Ellin & Tucker
Exelon/Constellation
Johns Hopkins-Circle K Club
Johns Hopkins-Alpha Phi Omega
Karina Association
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McDaniel College-Honors Program
National Aquarium Education
Prime Care Animal Hospital
Rosedale Federal S&L
Textron Systems Young Professionals Assoc.
Towson University-National Council of Negro Women
Towson University-Rugby Club
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UMBC's Enrollment Management





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



The Maryland Zoo in Baltimore
1876 Mansion House Drive
Druid Hill Park
Baltimore, MD 21217-4474

HOURS OF OPERATION

Administrative offices are open Monday through Friday, 8:30 a.m. to 4:30 p.m. The Zoo is open to the public from 10 a.m. to 4 p.m., daily during the months of March through December, and Friday through Monday during the months of January and February. The Zoo is closed Thanksgiving Day and Christmas Day.

When planning your next visit, please check the Zoo's website—www.MarylandZoo.org—for timely updates on events, programs, exhibits, and improvements. Follow the tabs on the website to reach any Zoo department, including Group Sales, Membership, and Learning & Community Engagement.

