

OUR IMPACT

2022 ANNUAL REPORT | PUBLISHED MARCH 2023



LETTER FROM THE DIRECTOR



2022 was marked by several significant events that will greatly impact the future of the Duke Lemur Center (DLC). The first was **the opening of the Anna Borrueel Center for Lemur Medicine & Research**, aka the “Borrueel Center,” in March. Funded by anonymous Duke alumnus, the Borrueel Center provides the advanced infrastructure and equipment needed to support our world-class veterinary and innovative research programs. The impact of this new facility on the DLC’s mission is just beginning to be realized as our level of medical care and the scope of our research programs are already making monumental leaps forward.

As we celebrated the opening of the Borrueel Center, the DLC began the process of reopening to students and the public after pausing many of its programs due to COVID. **The summer internship program resumed with profound changes** as we welcomed 19 college students from across the country. For the first time in the DLC’s history, six of the internships were paid, specifically supporting students who demonstrated financial need. This initiative was implemented after evaluating program engagement over the past 10 years and acknowledging that the unpaid status of the program was a barrier to a large subset of college students who needed to earn money in order to participate and to be able to return to school in the fall. The impact of these paid positions led to one of the largest and most diverse applicant pools the DLC has had for this program.

The DLC-SAVA Conservation program also supported a record number of students—12 American and 40 Malagasy—in Madagascar as DLC conservationists Charlie Welch and Dr. James Herrera returned to the island for the first time since 2019. While Charlie and James were stateside, Lanto Andrianandrasana, SAVA Conservation Project Coordinator, kept the DLC’s conservation programs moving forward despite the challenges of COVID.

As we neared the end of 2022, and after 27 years of service to the DLC, **Dr. Cathy Williams announced she was ready to hang up her stethoscope** and begin a well-earned retirement. In order to find the right person to fill Cathy’s enormous shoes, a national search was conducted and the DLC was very fortunate to find and hire Dr. Julie Ter Beest to take over the reins as our new Director of Veterinary Services. Julie is an experienced zoo veterinarian with a compassionate bedside manner and a management style that fits the DLC’s culture perfectly. Julie will be joined by new Associate Veterinarian Dr. Lana Fox in early 2023. Lana also comes from the zoo community, in addition to working several years in private practice. We are so excited to have these two veterinary professionals join our team and continue the DLC’s unwavering commitment to providing excellent medical care to our colony.

As always, I am forever indebted to our incredible team here at the Lemur Center for their endless energy and commitment to studying and protecting the lemurs and forests of Madagascar as well as providing the absolute best care for Duke’s lemurs. Our staff and volunteers are such a selfless group, who give so much day in and day out without complaint. Likewise, a heartfelt THANK YOU goes out to all of you who supported us throughout the year with your generosity and kindness—it means so much to all of us. As we look ahead to 2023 and a full return to pre-COVID operations, we look forward to seeing many of you in Durham and Madagascar.

A handwritten signature in black ink, appearing to read "Greg Dye".

GREG DYE
Executive Director
Duke Lemur Center

2022 IN REVIEW

ANIMAL CARE & WELFARE



LEFT: Beatrice as a youngster at the DLC. Photo by David Haring.

ABOVE: Beatrice with her infant in England. Photo © Chester Zoo.

BUILDING A BIGGER ARK

First Coquerel's sifaka born in Europe

An infant Coquerel's sifaka was born at the Chester Zoo in Cheshire, England from a pair of sifakas, Beatrice and Elliot, transported from the DLC in 2021. This birth represents a huge success for these animals and their species, with the Chester Zoo becoming the first zoo in Europe to successfully breed these rare lemurs.

Coquerel's sifakas are the third most endangered primates in the world. The collaboration between the DLC and the Chester Zoo is part of an international effort to build a larger genetic safety net to protect them from extinction.

ENHANCED ANIMAL WELFARE

Finding ways to continually improve the lives of our lemurs remains our highest priority. This year's initiatives were highlighted by:

- Creating two new mini free-ranging areas for animals that wouldn't ordinarily have forest access due to locomotion deficits, shyness, or behavioral concerns.
- Using positive reinforcement training to improve the care of the lemurs. For example, Hoku, a four-month-old red ruffed lemur, was the first youngster to receive her rabies vaccination voluntarily. Hoku eagerly participated in training sessions as her primary caretaker taught her that a visit from the vet tech was one of the best parts of the day!



NEW HIBERNACULUM USED FOR THE FIRST TIME

The new hibernation chambers in the Borruel Center provided space for 20 of our dwarf lemurs to torpor. The only place of its kind in the world, the hibernaculum allows us to control all aspects of the lemurs' environment, such as temperature, to mimic the conditions that modulate hibernation in the wild.

For the first time, "we're able to replicate, to a degree, the dwarf lemurs' experiences in Madagascar," says DLC research scientist Marina Blanco, Ph.D. "We can bring a little bit of Madagascar to the DLC."

2022 IN REVIEW

NON-INVASIVE RESEARCH

DLC RESEARCH IS BACK!

After COVID resulted in scientists delaying their research due to constraints in travel, finances, or other reasons, it seems all are eager to get started (or continue) all at once! With a plethora of exciting projects, a new research building, and planning finalized for a field station in Madagascar, 2022 has been a year of renewed growth and optimism.

DEDICATION OF THE BORRUEL CENTER

The Anna Borruele Codina Center for Lemur Medicine and Research was officially dedicated on March 5. The Borruele Center provides additional infrastructure critical to our programs, including a molecular lab, a cryostorage room, two hibernation chambers that allow fine-scale control of temperature and humidity, and indoor and outdoor enclosures that provide additional space and flexibility for research use.



MISSION STATEMENT

The DLC Research Department supports and advances science, scholarship, and biodiversity conservation through observational, exploratory, and non-harmful experimental methods focused on captive strepsirrhine primates in Durham, NC, USA and wild lemurs in Madagascar. Through our programs, we emphasize teamwork and collaborative equitable leadership and opportunities, and shared learning in the face of ongoing environmental change.

2022 RESEARCH HIGHLIGHTS

- » **Research trials surpassed 2021 numbers by 40%.** Similarly, and not by coincidence, the use of animal training for research increased by 35%
- » **Two full-time Research Technicians were hired,** expanding the research team to eight DLC staff
- » **The DLC's Madagascar Research Program was launched,** spanning geographical regions and fields of study and rooted in cross-disciplinary collaborations with in-country researchers
- » **Our planned field station in Anjajavy, Madagascar,** represents a significant step in the growth of infrastructure and formalized collaborations of the Madagascar Research Program. In August, all agreements were finalized and the best site was selected for the construction of the field station. Materials are en route to Madagascar, and construction is scheduled for March 2023
- » **Dr. Lydia Greene's research** on sifakas demonstrated that the DLC's free-ranging sifakas show foraging and ranging patterns similar to those of Madagascar's wild sifakas
- » **Dr. Greene successfully completed** her position as an NSF Postdoctoral Fellow and is now a DLC Postdoctoral Associate. She is expanding her research focus beyond, but still incorporating, the microbiome to the study of sifaka ecology and nutrition with a comparative and complementary field/captive approach
- » **Dr. Marina Blanco's 2021-22 torpor season** achieved a critical milestone, demonstrating that captive dwarf lemurs retain the physiological mechanisms to hibernate when in conditions similar to their wild counterparts. The DLC's dwarf lemurs sustained hibernation for more than four months without food provisioning; in contrast, dwarf lemurs with daily food underwent daily torpor but did not hibernate

2022 IN REVIEW

VETERINARY MEDICINE



CELEBRATING THE OPENING OF THE MOST ADVANCED LEMUR HOSPITAL IN THE WORLD

While there have been many goals achieved and lots of successful medical cases, this year's accomplishments are focused on two major events. The first is the opening of the Anna Borrueal Codina Center for Lemur Medicine and Research. This new hospital facility is the most advanced lemur hospital in the world, complete with digital imaging systems, advanced diagnostic equipment, and modern treatment and surgical suites. (Above, DLC veterinary staff perform an emergency blood transfusion—a procedure that would've been nearly impossible without the equipment provided by the new Borrueal Center.)

Not only does the Borrueal Center greatly enhance the medical care for the entire colony, it also serves as a teaching hospital for veterinary students from the United States and around the world, including Madagascar.



CATHY WILLIAMS, D.V.M. RETIRES AFTER 27 YEARS

Second, as the DLC's veterinary team transitioned into their new facility, the Lemur Center began its search for the next veterinarians to lead their medical program. Cathy Williams, D.V.M., will retire in early 2023 after 27 years of service to the DLC. Finding the right person to fill Cathy's enormous shoes required a national search and several intense interviews.

Fortunately, that search led us to Julie Ter Beest, D.V.M. Dr. Ter Beest is an experienced veterinarian who comes from the zoological community and is the perfect fit to take the reins as DLC's new Director of Veterinary Services. Joining Dr. Ter Beest is our new Associate Veterinarian, Lana Fox, D.V.M. Dr. Fox is an experienced veterinarian from the zoological and private practice fields.

We are excited to have this new team in place and to be able to maximize the potential the new veterinary hospital creates.



WATCH NOW: At the Duke Lemur Center, every animal is precious. So when a staff member notices an injured lemur, the whole team mobilizes to protect her. NBC's Dagmar Midcap, who happened to be filming onsite that day, follows the the DLC's veterinarians as they rush to save young Cassia.

LEMUR.DUKE.EDU/NBC

2022 IN REVIEW STUDENT PROJECTS



SUMMER INTERNSHIP PROGRAM **Paid Internships Offered for First Time in DLC History**

The DLC's summer internship program returned in '22, and we were thrilled to host an incredible group of 19 undergraduate students from across the United States! Interns spent 10 weeks during the summer learning about and conducting research in behavioral ecology, paleontology, animal welfare, husbandry, and science communications.

For the first time in the history of our internship program, we were able to offer six paid internships to students who demonstrated financial need. These paid opportunities were part of our larger goal to reduce barriers to participation in learning opportunities at the Lemur Center and to engage students from racial and ethnic groups that are historically underrepresented in science.

Ultimately, we hope to work towards a program where all intern positions are funded. If you're interested in supporting the Lemur Center in this way, learn more about the "Support a Summer Intern" giving opportunity by visiting lemur.duke.edu/tigifts.

DEAI PROGRAM OF EXCELLENCE

The Diversity Task Force finalized the DLC's first Diversity, Equity, Access, and Inclusion (DEAI) plan, which was recognized as a program of excellence by the Association of Zoos and Aquariums during the Lemur Center's re-certification inspection in June.

RECORD-BREAKING VOLUNTEER PARTICIPATION

135 volunteers contributed 9,538 hours of service to the DLC's mission in 2022—our largest group of volunteers in history!

The Education Department engaged a record number of volunteer docents during their busy summer season; a large group of Technician Assistants was onboarded to support the Husbandry Department in the fall; and the DLC Museum of Natural History team enlisted volunteer help with transcription of historical records and fossil collection management.

In addition, 16 student, staff, and corporate community groups participated in service events at the DLC in 2022. A combined 215 volunteers assisted with various maintenance and groundskeeping projects throughout the year to support the DLC staff.

9,538

**HOURS OF SERVICE DONATED
BY DLC VOLUNTEERS IN 2022**

2022 IN REVIEW

CONSERVATION

REFORESTATION

Reforestation continues at a steady pace. Community involvement, such as with Ambanitaza, has increased and gained enthusiasm on the part of local people. In 2022, we planted more than 55,000 saplings.

WOMEN'S HEALTH

The DLC-SAVA Conservation program continues to support women's health in collaboration with NGO Marie Stopes Madagascar (MSM). Women's reproductive sessions are drawing more participation on the part of village women. In 2022, we visited 26 villages and provided approximately 780 women with contraceptives. This increase appears to be a result of local women becoming more comfortable with the MSM procedures and the use of contraception.

ALTERNATIVE PROTEIN SOURCES

Limited or no access to sources of protein is a major cause of bushmeat hunting, including the hunting of lemurs. DLC-SAVA supports a fish-farming association with 24 members to create and maintain fish ponds, which raised and harvested over 300 kilograms of fish (2,700 individuals) in 2022.

STUDENT INVOLVEMENT

Research has continued and, with the Duke Bass Connections grant that James was awarded, now includes both Duke students and additional Malagasy students. Another Bass Connections grant has been awarded for continuation and expansion of the same ecological and socio-economic work and research for 2023-24.



ENVIRONMENTAL EDUCATION

The environmental education program led by Evrard continues to grow activities, especially its "Lemur Awareness" program. In an exciting development, Evrard is in the process of adding land to his New Generation Garden, which will provide more space for hands-on work by students. The teaching garden provides an excellent example of how land can respond if managed correctly and sustainably and is already looking like an island of multi-use forest in a sea of degraded land.

REGENERATIVE AGRICULTURE

Regenerative agriculture training sessions are yielding good percentages of converts to the sustainable techniques. This year, 35 farmers were trained in System of Rice Amelioration (SRA). Traditional rice farming techniques start with cutting and burning vegetation, which clears the land and produces ash. This often leads to soil erosion and the quick regrowth of introduced weed species, making this method unsustainable. SRA starts with high quality seed stock with shorter time to harvest, and adapting seed bed preparation, timing of transplanting, and planting rice in straight and systematic rows which leads to yield increases of 50% to 100%.

2022 IN REVIEW

EDUCATION AND OUTREACH



ONSITE TOURS

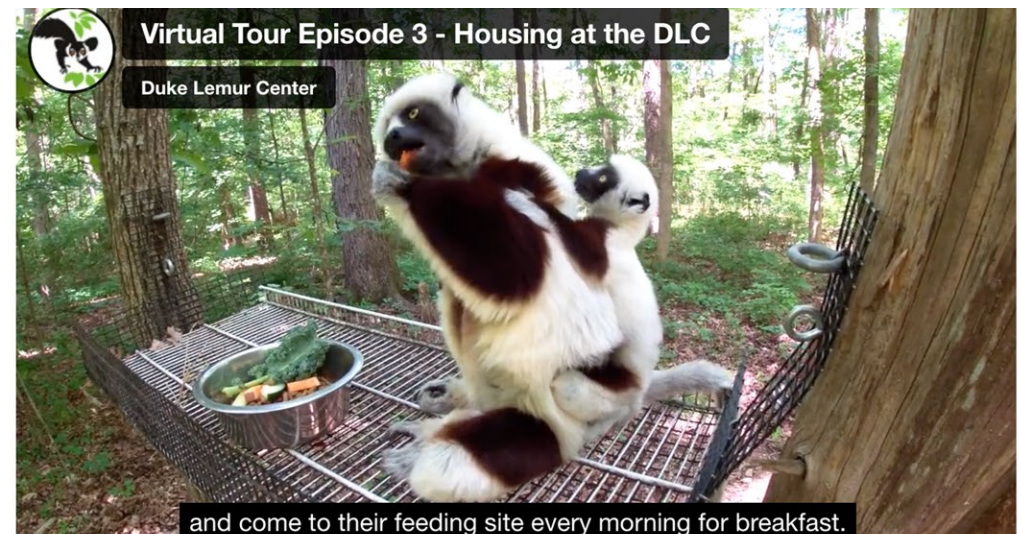
In May, we reopened for an expanded summer tour season just in time for Duke's commencement weekend. We were thrilled to bring back Behind the Scenes tours, seasonal educators, and education interns for the first time since the pandemic, and we trained over 30 new volunteers—who are now part of the largest volunteer team in the education department's history! Together, the education team engaged with almost 15,000 visitors this year, which is more than triple our 2021 visitor count.

EDUCATIONAL OUTREACH

Our new seasonal tour model allowed us to focus on outreach programs in the fall and spring semesters, and we are already engaging a new class of Lakewood Montessori sixth-grade students (pictured above) with lemur science. Thanks to our successful pilot program, we were awarded over \$70,000 in federal grant funds. We are excited to expand our local and virtual outreach efforts with a focus on diversity, equity, access, and inclusion.

VIRTUAL LEARNING

Fully revised and expanded in 2022, our free virtual tour experience is bigger and better than ever! If you've ever wondered how our lemurs free-range without getting lost, our new housing episode answers this question and more. Watch at lemur.duke.edu/virtual-tour.



LISTEN NOW! In collaboration with the DLC Museum of Natural History, we launched the Duke Lemur Center's official podcast: Aye-aye Pod!

This podcast is focused on providing more opportunities to dive deeper into the world of lemurs and Madagascar, as well as the many people who care for, study, and protect the island's legendary biodiversity: lemur.duke.edu/podcast.

2022 IN REVIEW COMMUNICATIONS



JOHN CLEESE FOR WORLD LEMUR DAY

Legendary British comedian and lemur aficionado John Cleese returned in 2022 to voice his second semi-annual charity commercial in support of the Duke Lemur Center's Adopt a Lemur program! Symbolic lemur adoptions help support animal care at the Duke Lemur Center and the DLC's conservation programs in Madagascar.

Conceived and produced by Secret Station Films founder Joe Whelski, the project is a labor of love for all those involved. This year's spot is an animation, created by Titmouse and spearheaded by director/ animator Parker Simmons and producer Lauren Siller. Crafted by the writing team of Alyssa Briddes, Nick Goodey, and Joe Whelski, with sound design by Hungry Tapes and VO recording by BtOven Music, the 45-second commercial was released in late October in celebration of John Cleese's birthday (October 27) and World Lemur Day (October 28).

John Cleese and all others involved in the project lent their time and talent to the commercial pro bono, at no charge to the DLC. Watch at lemur.duke.edu/cleese.

NBC/LX SERIES FEATURES THE DLC

Follow NBC's Dagmar Midcap, host of "Down to Earth," and LX News storyteller Cody Broadway as they take you inside the Duke Lemur Center, to meet the lemurs and the devoted team of scientists and researchers fighting to save them.

The NBC/LX team traveled to Durham in May to capture our mission in action—and just happened to be present when Cassia, a Coquerel's sifaka, was bitten by a copperhead snake. The film crew captured the discovery of the injury and the incredible response of our animal care and veterinary teams to save her life. In doing so, they share what makes lemurs and the DLC so special.

The first part of the series is available to view, with additional chapters filmed in Madagascar with the DLC's research team coming soon! Watch at lemur.duke.edu/nbc.



The DLC's annual magazine released just in time for the holidays! The 56-page publication highlights female dominance in primatology and the lemur world, female farmers of Madagascar, and the women leading the way at the DLC. We hope these stories will inspire students, particularly young women, interested in pursuing careers in STEM.

Contributors included 2022 comms intern Andrea Tejada and the DLC's first Undergraduate Fellow in Communications, Rhiannon See.

Purchase in the gift shop or read free at lemur.duke.edu/magazine.

2022 IN REVIEW

MUSEUM OF NATURAL HISTORY

GRANTS AND AWARDS

We expanded our collection space with new specimen cabinets that were funded a grant from the National Science foundation. Now, we have more space in our "dry room" for our most delicate specimens.

We were awarded a grant from the Institute for Museum and Library Services to build a new cataloguing system to better track specimens and research in the collection. We're being advised by DLC Data Manager Amanda Mazza so the living and fossil collections databases can exchange information.

VISITING RESEARCHERS

This fall, we welcomed Visiting Researcher Shorouq Al-Ashqar to the collections, so she could spend the semester studying our Egyptian fossil collections. Shorouq is a graduate student at the American University in Cairo, a university we are partnering with to learn more about the ancient environments that shaped monkey and lemur evolution. Shorouq is working with Curator of Fossils Dr. Matt Borths to describe a 30 million year old carnivore from Egypt.



Thousands of digitized specimens from the DLC collection have been viewed and downloaded from our online collection accessioned on the Duke- supported website MorphoSource by researchers around the world.

Researchers have also visited the physical collections or requested specimen data, learning more about giant lemur diets, how to explore food webs in Africa 20 million years ago, and how early primates were related to each other.



DLCMNH FIELD TEAM TRAVELS TO WYOMING, USA

The DLC Museum of Natural History staff returned to the field for the first time since the start of the pandemic, traveling to southwestern Wyoming in July to collect 50 million year old fossils from a time when lemur-like primates were leaping through the forests of North America. The team included the fossil lab's summer undergraduate intern, Ren Collins, and a Duke Evolutionary Anthropology graduate student, Julia Stone.

The fossils we collected in Wyoming are now safely back at the DLCMNH and being prepared for study by Duke undergrad researcher Orion Kornfeld, under the guidance of Fossil Preparator Karie Whitman.

Pictured: Orion in the fossil preparation lab using an Aircscribe to remove rock from the 50 million year old jaw of a rhino-like creature.

2022 IN REVIEW DEVELOPMENT

Between July 1, 2021 and June 30, 2022, the DLC received just over \$3.1 million in gifts, including the \$2 million payment from our incredibly generous friend, an anonymous Duke alumnus, toward the \$8 million commitment toward the construction of the Anna Borrueal Codina Center for Lemur Medicine and Research. Noteworthy gifts and commitments of \$25,000 or more through Dec. 31, 2022 included:

- » We were thrilled to receive several naming gifts to support an endowment for the operations of the Borrueal Center from: Elena Marie Braun and Sean Champlin Burbank, The Paul Edwards Family, Mike and Lexi Gordon, Drs. Sara E. Miller and David N. Howell, and Michael and Maureen Rhodes
- » Significant contributions in support of our work in Madagascar were received from Julie and Darren Cooke, Rob Feagin and Susie Temple, Bob and Sue Knox, the Kathryn McQuade Foundation, Dr. Naomi Lynn Nelson, and General Mills, Inc.
- » A gift and pledge toward the DLC's general operations and conservation work in Madagascar was received by: Jane Barthelme, and Michael and Karen Stone
- » New legacy gift commitments were made by: Dr. Sharon Louise Smith, Dr. Naomi Lynn Smith, and an anonymous donor. We're truly honored by their decision to include the DLC in their estate plans and we welcome them into our Legacy for Lemurs Society
- » A gift and continued commitment to support technicians' travel expenses to/from Madagascar was made by Drs. Russel C. and Elisabeth Stanger Cook
- » An annuity to benefit the DLC was established with a special gift from Mike and Lexi Gordon
- » A grant from the FS Foundation was received to support our Malagasy Veterinary Internship Program in 2023

| % of Total | Gift Designation Category |
|------------|--|
| 9.5% | Adopt a Lemur Program |
| 11.1% | Gifts to establish or grow endowment funds |
| 4.8% | Events and sponsorships |
| 11.3% | Grants |
| 32.8% | Madagascar Programs fund |
| 7.1% | Other restricted gifts |
| 23.5% | Unrestricted gifts |

EVENTS THAT MADE A DIFFERENCE

"Nurture the Extraordinary" was the theme of this year's Mission: Madagascar celebration, spotlighting our work with students to create the next generation of environmental stewards. We offered a reception for our giving societies on 9/24, plus a few special discovery experiences onsite and an online auction to benefit our conservation programs.

Thank you to Fullsteam Brewery, to all of our sponsors, and to every one of you who made a donation or participated in our online auction! The onsite donor events and its promotions raised more than \$40,000 in sponsorships and auction support, as well as prompting renewed and new gifts from friends and supporters.

Other events that made a difference included Lemurpalooza, our virtual 5K during Earth Day weekend, the Lemurs & Roses Valentine, and Giving Tuesday. These promotions raised more than \$76,000!

WE CELEBRATE EVERY GIFT!

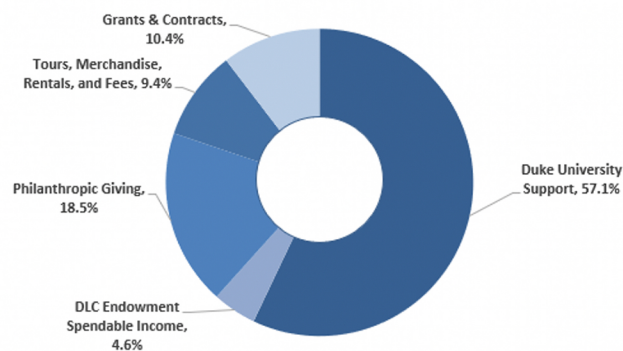
Gifts large and small make a difference, and there are many ways for you to support an area of our work that interests you. While the DLC does not provide a public list of Giving Society members in our publications or on our website, we do recognize our Director's Society, Circle of Life, and corporate donors of \$5,000+ on our wall in the Lemur Landing Gift Shop. All giving society members are eligible for benefits as our way to thank them for their generosity. Learn more about donation options at lemur.duke.edu/donate.

2022 IN REVIEW

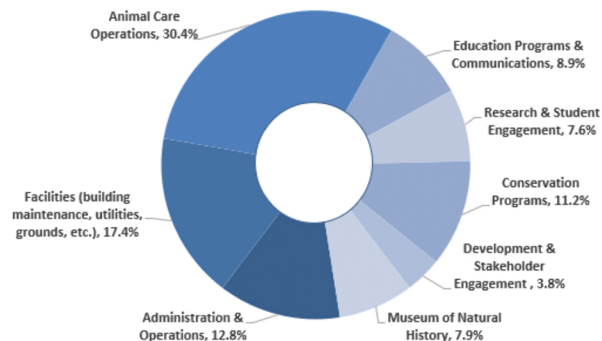
FINANCIAL OVERVIEW



FISCAL YEAR 2022 INCOME



FISCAL YEAR 2022 EXPENSES



FISCAL YEAR 2022 FINANCIAL SUMMARY

| Income | |
|---------------------------------------|---------------------|
| Duke University Support | \$ 2,854,482 |
| DLC Endowment Spendable Income | \$ 230,628 |
| Philanthropic Giving | \$ 926,523 |
| Tours, Merchandise, Rentals, and Fees | \$ 471,640 |
| Grants and Contracts | \$ 519,552 |
| Total Income | \$ 5,002,826 |

| Expenses | |
|----------------------------------|---------------------|
| Administration & Operations | \$ 611,806 |
| Animal Care | \$ 1,450,659 |
| Maintenance, Grounds & Utilities | \$ 831,897 |
| Education & Communications | \$ 422,922 |
| Research & Student Engagement | \$ 363,033 |
| Conservation Programs | \$ 533,711 |
| Dev't & Stakeholder Engagement | \$ 183,048 |
| Museum of Natural History | \$ 375,394 |
| Reserves for future programming | \$ 230,357 |
| Total Expenses | \$ 5,002,826 |

I'm so proud of what we've achieved, and I couldn't be more grateful to our staff and volunteers who are the absolute best at what they do. The Lemur Center may be a small organization, but we lead the way when it comes to conserving and protecting the lemurs of Madagascar. I couldn't be prouder.

—Greg Dye,
Executive Director



A PERFECT SCORE: In 2022, the DLC earned a flawless AZA accreditation inspection. This achievement is so rare that only five facilities have earned a perfect score in the AZA's nearly 50 years of accreditations. Read more: lemur.duke.edu/magazine.



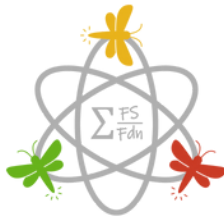
The Duke Lemur Center is a non-profit, tax-exempt organization operating under Duke University (EIN 56-0532129), and is accredited both by the Association of Zoos and Aquariums (AZA) and the American Association for Accreditation of Laboratory Animal Care (AAALAC).

Thank you to the following premier corporate sponsors and other organizations whose support provided a cornerstone to our success in fiscal year 2022. Click on each logo to learn more about them!

DUKE LEMUR CENTER PREMIER SPONSORS AND PARTNERS



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The FS Foundation

