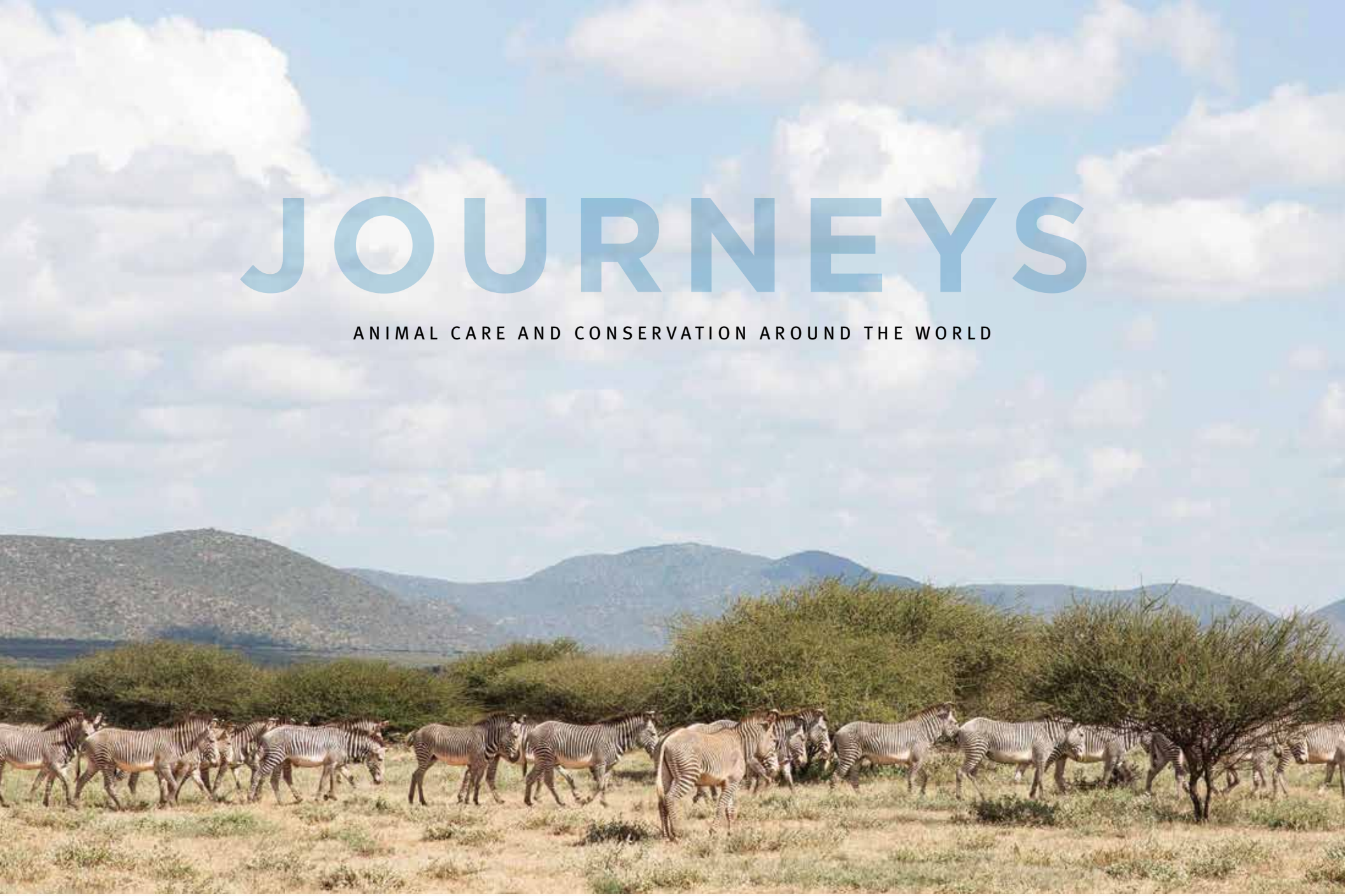
JOURNEYS

ANIMAL CARE AND CONSERVATION AROUND THE WORLD



2024

Saint Louis Zoo
Animals Always®

White tern

CONSERVATION IS A JOURNEY…

It's a journey to bring species back from the brink of extinction.

It's a journey to conserve animals' native habitats.

It's a journey to bolster communities that coexist with wildlife.

It's a journey, physically and emotionally, for team members to embark on fieldwork.

IN ALL, WE'RE ON A JOURNEY TOGETHER FOR A BETTER TOMORROW.

In this new publication, we're thrilled to bring you stories from the field, featuring stunning photography from recent conservation projects both near and far from our St. Louis region.

Our conservation work is as diverse as the wildlife and landscapes you'll see in these pages, but we always have a common goal: to care for animals and create more sustainable ecosystems for all living things.

Thank you for your support, and please enjoy this inaugural edition of "Journeys: Animal Care and Conservation Around the World."

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American red wolf

Over 600
SCIMITAR-HORNED ORYX
now live in their native habitat in Chad.

Critically endangered:
AMERICAN RED WOLVES
Only **20** red wolves remain in the wild today in North Carolina, and an additional **290** exist in human care.

MARIANA ISLANDS BIRDS
For over **25** years, the Saint Louis Zoo has worked with partners to complete **11** translocations of **five** species to **three** recipient islands.

20 animal species studied in Forest Park by the Saint Louis Zoo Institute for Conservation Medicine and its partners.

GREVY'S ZEBRAS

120 teams and over **600** people participated in the Great Grevy's Rally, taking more than **14,000** photos. Each of the Saint Louis Zoo's three teams saw about **80** zebras both days of the Rally.

Over the course of **13** years, the Saint Louis Zoo has released almost **12,000** ENDANGERED HELLBENDERS – bred and raised at the Zoo – into Missouri rivers.

AMERICAN BURYING BEETLES

14,654 raised by the Saint Louis Zoo since 2004; **6,000** reintroduced in Missouri and Ohio.

Dr. Lisa Kelley, Executive Director of the Saint Louis Zoo WildCare Institute, documents the start of her conservation journey in the Mariana Islands.

Decades-long Partnership Protects Birds in U.S. Territory in the Pacific

The accidental introduction of the invasive brown treesnake to the island of Guam led to a decades-long mission to protect endangered birds on Guam and the Commonwealth of the Northern Mariana Islands. The snake's presence devastated the island's bird populations, leaving only two endemic bird species on Guam: the Sali (Micronesian starling) and the Yayaguak (Micronesian swiftlet).

For 30 years, the Saint Louis Zoo has partnered with other conservation groups to breed and translocate endangered birds in the Commonwealth of Northern Mariana Islands, a U.S. territory north of Guam. This conservation work has resulted in the following species' translocation: Nosa (bridled white-eye), Canario (Saipan golden white-eye), Totot (Mariana fruit dove), Na'abak (rufous fantail), and Chickurikan Tinian (Tinian monarch).

Above: Gå'ga' karisu (Saipan reed warbler)

Nosa (bridled white-eye)

"In 1994, we were invited by the U.S. Fish and Wildlife Service to join a group of zoos to develop the standard operating procedures for breeding some of the endemic Mariana Islands birds in human care," said Michael Macek, Saint Louis Zoo Director, who worked with the Saint Louis Zoo WildCare Institute Center for Avian Conservation in the Pacific Islands for more than 20 years.

Local wildlife officials wanted to be prepared should the bird populations drop to dangerously low levels. The Zoo's team collected birds, brought them back to the U.S. and bred them in human care in order to establish a breeding protocol. Over the years, the program evolved to include translocating birds to help establish new populations and developing community education programs to support the conservation objectives.

Consistency and longevity are crucial because island ecosystems are incredibly fragile, and any conservation work takes decades to see results, Macek said.

In 2024, Zoo staff traveled to the Mariana Islands to participate in the Mariana Avifauna Conservation Project. The critically endangered Saipan reed warbler, or Gå'ga karisu in the Chamorro language, was brought into human care for the first time. Project partner Pacific Bird Conservation led the effort, guiding the team in collecting 20 birds by mist netting. Zoo team members conducted veterinary exams, made key behavioral observations and established groundbreaking husbandry methods. The birds were all released in good health at their original capture sites, and the knowledge gained will inform future potential translocation efforts for the species.

The Zoo's consistent partners in the Mariana Islands include the Commonwealth of the Northern Mariana Islands Division of Fish and Wildlife, Association of Zoos and Aquariums, Pacific Bird Conservation, U.S. Fish and Wildlife Service and Mariana's Department of Aquatic and Wildlife Resources.

A fieldwork site in Rota, the southernmost island in the Commonwealth of the Northern Mariana Islands.

A Saipan golden white-eye receives care from Saint Louis Zoo Bird Keeper Mallory Balsat.

Left: A Na'abak (rufous fantail) on its nest. Above: Experts provide a health assessment to a Gâ'ga' karisu (Saipan reed warbler).

Grevy's zebra in Kenya; approximately 2,500 remain in the wild.

Great Grevy's Rally Provides Insight to Help Preserve Critically Endangered Zebra

Grevy's zebras once roamed five countries in the Horn of Africa, but habitat loss, food competition and droughts have made Grevy's zebras one of Africa's most endangered large mammals. Approximately 2,500 remain in the wild, with 90% in Kenya and the remainder in Ethiopia.

The Saint Louis Zoo WildCare Institute Center for Conservation in the Horn of Africa has partnered with the Grevy's Zebra Trust (GZT) to help address the urgent need to conserve Grevy's zebras. Since 2016, the Zoo has participated in the Great Grevy's Rally, a photographic census held every two years to gauge how many Grevy's zebras remain in northern Kenya. Facilitated by the Kenya Wildlife Service and GZT, the zebra count is an important way to measure the impact of conservation efforts around this endangered species.

Six Zoo team members traveled to Kenya in January 2024 to help with the most recent count. Over two days, Rally participants journeyed across large swaths of bumpy terrain in safari vehicles, searching for the zebras.

"When my group spotted zebras through the scrubby vegetation, we'd take a quick count," said Jeremy Martin, Saint Louis Zoo WildCare Park Keeper. "The challenge was to then obtain photos of the right side of every animal. Each zebra has a unique stripe pattern, kind of like a natural bar code, that can be used to tell each animal apart."

Photos taken during the 2024 census will be entered into an A.I. program that analyzes stripe patterns and calculates a rough estimate of how many zebras remain in the region.

The Saint Louis Zoo has partnered with the GZT since its inception and supports programs that teach local people conservation skills that give them access to other means of income. GZT's Grevy's Zebra Scout Program employs 29 Grevy's Zebra Scouts from seven different communities to monitor the zebras and foster positive attitudes toward the species. The scouts observe the zebras' health and provide valuable data on body condition, mortalities and movements, which help the GZT better target its management interventions, such as water provision or supplementary feeding during prolonged drought periods. ●

Left: The magnificent landscape in Kenya, where the Great Grevy's Rally takes place. Above: A Grevy's Zebra Scout leads conservation efforts in Kenya. Scouts are employed by the Grevy's Zebra Trust, a longtime Saint Louis Zoo partner, and work as citizen scientists to monitor the zebras. Right: Adult Grevy's zebras can go up to five days without water; however, mares with young foals must drink every day. Drought is a major threat to the survival of the species.

Left: Young Grevy's zebras stay close to their mothers at all times for protection and food. Above and right: Team members participate in the Great Grevy's Rally, a photographic census that gauges how many Grevy's zebras remain in northern Kenya. In total, 120 teams and over 600 people participated in the Rally, taking more than 14,000 photos.

Justin Elden, Saint Louis Zoo Curator of Herpetology and Aquatics, works with an Armenian viper.

Unmatched Data on Armenian Vipers Lays Groundwork for Further Conservation Work

Picture an expansive blue sky crowning mountains of green and brown, snow-capped peaks in the distance. Envision fields of wildflowers in every color of the rainbow and giant, sunset-hued rocks jutting from the landscape. Imagine the cool, moist air and the earthy scent sailing on the breeze.

This is Armenia, home to the wild animals and wild places Justin Elden strives to protect through his work as Director of the Saint Louis Zoo WildCare Institute Center for Conservation in Western Asia.

"Western Asia and Armenia have such a unique mixing of cultures and biology, and when you're in the field there, it's really wild country. It's rugged and expansive and big," said Elden, who is also the Zoo's Curator of Herpetology and Aquatics. Elden travels to Armenia for fieldwork about once a year as part of the Center's work to save the Armenian mountain viper and other endangered reptiles. Habitat loss from agricultural developments, timber harvesting, mining and other threats has led to a sharp decline in the viper populations.

Fieldwork includes collecting population data on the Armenian viper and other species of imperiled reptiles and surveying for other animals, known and unknown.

Researchers use mark-recapture techniques to monitor viper populations. They capture the animals, mark them with PIT (passive integrated transponders) tags similar to those used with pets, and observe them over time. Collected data is used to advocate for the protection of habitats for vipers and other species of animals and plants. Two decades of research and conservation efforts in this area has made a difference.

"Based on the work carried out by the WildCare Institute, we now have the largest dataset on a mountain viper species in existence," Elden said.

Left: An adult male Armenian viper found in the field in spring 2024.
Above: Elden and Armenian herpetologist Levon Aghasyan, Ph.D., collect data on an Armenian viper.

Although still threatened, the population of Armenian mountain vipers is now healthier throughout Armenia due to the WildCare Institute's work. Protected land areas in southern and central Armenia have been created or expanded, providing additional protection for the Armenian mountain viper, its habitat and its food sources. The change in the viper's habitat is unmistakable after receiving formal protection. For example, in central Armenia, the Zoo's work led to a new herpetological preserve in an area once severely impacted by livestock overgrazing.

"Seeing the conservation of this area be taken seriously and seeing where the vegetation has grown close to 6 feet high in some areas where it was just dirt before, it's amazing," Elden said. "This is beneficial for the vipers and the ecosystem as a whole, which is what we are really striving for here. Seeing this habitat be reborn and seeing what it's supposed to look like, it's one of the most amazing things I've gotten to be part of."

Dr. Aghasyan relocates a viper.

Above: Western Asia is home to a large variety of endemic and rare species of reptiles, including vipers and giant legless lizards, as pictured above.

Saint Louis Zoo staff and volunteers, as well as Sedgwick County Zoo staff, worked together to dig and place American burying beetles in their new homes.

Intensive Fieldwork for American Burying Beetles Requires Many Volunteers, Partners

The Saint Louis Zoo WildCare Institute Center for American Burying Beetle Conservation has worked with its partners for more than two decades to reverse the loss of a critically endangered species of beetle in Missouri and other regions in the U.S. Historically, the American burying beetle was found in 35 states, but now only exists in six.

The Center team, made up of Saint Louis Zoo staff and volunteers, reintroduces approximately 300 pairs of beetles into the wild each year. Early fieldwork in May involves surveying sites where beetles were previously released and gathering data on the insects' movements and survival rates. In the heat of summer, the team digs holes for breeding pairs and places them inside with a dead, pen-raised quail as resource material. The insects eat dead animals and recycle their decomposing components back into the environment. The entire release process is a huge undertaking that requires help.

"We get a lot of volunteers to help us, and those volunteers come from all over," said Bob Merz, Assistant Director of the Saint Louis Zoo WildCare Institute and Center Director. "All the people involved are putting their hearts and souls and sweat into this."

To complete its work, the Center partners with the Missouri Department of Conservation, The Nature Conservancy and the U.S. Fish and Wildlife Service. The Center also relies on volunteers from Zoo ALIVE (the Saint Louis Zoo's teen volunteer group), Missouri Master Naturalists, the Sophia M. Sachs Butterfly House in St. Louis and nearby zoos such as the Johnny Morris Wonders of Wildlife National Museum and Aquarium in Springfield, Missouri; the Sedgwick County Zoo in Wichita, Kansas; and the Tulsa Zoo in Tulsa, Oklahoma.

American burying beetles are a type of carrion beetle. They feed off dead animals like mice, birds and snakes.

Zoo staff and volunteers prepare the release site by measuring the distance between underground release chambers.

Zoo staff and volunteers dig chambers that will house the beetle pairs and their offspring.

Above: Zoo staff and volunteers secure protective fencing over the American burying beetles' release chambers to deter potential scavengers.
Right: A view of the protected release site and future home to wild American burying beetles in southwest Missouri.

Saint Louis Zoo Hellbender Keeper Brittany Kostka inspects an eastern hellbender before release into the wild.

Turning the Tide on Hellbender Conservation in Missouri

Missouri summers often involve a relaxing float down one of the state's rivers, where the current does most of the work. But for Herpetarium staff at the Saint Louis Zoo, summertime on the river means collaborating with other conservationists to release hundreds of Zoo-bred Ozark and eastern hellbenders back into the wild.

"Those days are really exciting," said Brittany Kostka, Saint Louis Zoo Hellbender Keeper. "The propagation of hellbenders is so important, and when we get to go put those animals back out to the river, we get to see the Center come full circle for why we do this project and why we work with these animals so closely."

The hellbender is the largest salamander species in North America, and Missouri is the only state where the Ozark and eastern subspecies can both be found in the wild. In the last four-plus decades, populations declined sharply due to environmental threats, but breeding and reintroduction efforts by the Saint Louis Zoo WildCare Institute Ron and Karen Goellner Center for Hellbender Conservation are working to turn the tide. Over the course of 13 years, the Center has released almost 12,000 endangered hellbenders – bred and raised at the Zoo – into Missouri rivers.

Prior to release, keepers PIT-tag (passive integrated transponders) each hellbender, giving it an individual identifier, and document each animal's weight and measurements. Zoo veterinary staff also give the animals a checkup to ensure they are healthy for release. Release days start early, usually before sunrise. Animals are loaded into coolers and driven two or three hours to the chosen river.

There, Zoo staff meet Missouri Department of Conservation (MDC) representatives who scouted release locations. Before being loaded into boats for a brief river journey, the hellbenders' PIT tags are scanned to record where each animal is released. Next, keepers such as Kostka don wetsuits and snorkel gear and climb into the river with a net full of hellbenders. Beneath the water's surface, they search for large rocks with one entrance to protect against predators. Once an appropriate site is found, they withdraw a hellbender from the net and guide the animal into its new home. Release days such as these happen several times over the summer, and the Zoo has been working with its partners at the MDC and U.S. Fish and Wildlife Service for over a decade to make these releases a reality.

"The fact that we are able to focus on a species that is so important and so special to this state is truly impactful," Kostka said. "These species are indicators on whether our water systems are healthy or not. Where you find hellbenders, you have healthier water systems because they require cool, clean, crisp, fast flowing, heavily oxygenated, low polluted, low siltation streams and rivers. If we are able to find the species in these rivers, then we know we are protecting our rivers and also doing a really good job of taking care of the entire ecosystem."

Above: Hellbenders are large aquatic salamanders, and Missouri is the only state that contains both recognized subspecies of North American hellbenders.
Right: Saint Louis Zoo Hellbender Keepers prepare to release animals back to the wild.

Hellbenders live under flat rocks and in bedrock crevices in large permanent streams and rivers. It is a slow swimmer and often moves by walking along the bottom.

A red wolf pup during a checkup at the Saint Louis Zoo Sears Lehmann Jr. Wildlife Reserve.

Effort to Protect Critically Endangered Wolves Leads to Birth of Four Pups

Once extinct in the wild, American red wolves are the most endangered wolf species in the world. Roughly 20 red wolves remain in the wild today in North Carolina, and an additional 290 exist in human care. A breeding program at the Saint Louis Zoo Sears Lehmann Jr. Wildlife Reserve is providing hope that more red wolves will one day roam free in the American wilderness.

Four American red wolf pups were born during the first-ever breeding season at the Wildlife Reserve in 2024. Otter, a female pup, was born April 26 to parents Lava and Tyke. Female pup Molly and male pups Finn and Obi were born May 4 to first-time parents Ladybird and Wilber.

"Hunting, habitat loss and human misconceptions about wolves have all played a role in the plight of the red wolf today," said Regina Mossotti, Vice President of Animal Care at the Saint Louis Zoo and program leader for the Association of Zoos and Aquariums (AZA) American Red Wolf Saving Animals From Extinction (SAFE) program. "But every new birth offers hope for future reintroduction efforts for this vital national treasure."

The wolves live in a private, protected natural area closed to the public. Peggy Lehmann donated 355 acres to the Zoo about 40 miles southwest of St. Louis to honor her late husband, Sears Lehmann, Jr. The Zoo built seven habitats on 20 acres on the property, and the Wildlife Reserve began accepting wolves from other conservation organizations in October 2022.

Keeping the Wildlife Reserve closed to the public is a crucial step in the possible reintroduction of red wolves into the wild. The private setting allows the resident red wolves to maintain their natural behaviors and survival skills with limited human interaction, which will keep the wolves safe should they ever be selected for release into the wild.

"We don't call the wolves by their names. We don't talk to them, and we stay as quiet as possible when around their habitats," explained Saint Louis Zoo WildCare Park Keeper Jeremy Martin. "These individual wolves (or perhaps their pups or grand-pups) have the chance to be released into the wild. For their own safety, the less familiar they are with humans, the better."

Martin said keepers provide the wolves a high-quality diet, clean water and "housekeeping services" such as excrement removal.

"We feed the packs deer carcasses, which teaches them to recognize deer as a food source and prepares them for when they will need to find their own meals in the wild," Martin said. "To take care of our packs, we use cameras to check on them and make sure they're happy and healthy."

Many individuals and organizations work together to conserve this critically endangered wolf species. The Zoo's breeding program operates in partnership with the AZA American Red Wolf SAFE program and the U.S. Fish and Wildlife Service (FWS). The SAFE program helps manage red wolves in human care at over 50 institutions across the U.S. and works on conservation efforts in the field, while the FWS manages the wild red wolf population and reintroduction efforts in the U.S.

The pups receive a bill of good health from our Animal Care teams. They will remain with their parents for at least two years, but then may be sent to other organizations to start their own packs to further increase the population of the critically endangered species. They could also potentially be selected for release into the wild in a location designated by the U.S. Fish and Wildlife Service.

Longtime Mission Protects Critically Endangered Lemurs and Habitats

Madagascar is home to critically endangered lemur species and other plants and animals found nowhere else in the world, and protecting these animals and their habitats remains one of the longest-running missions of the Saint Louis Zoo WildCare Institute. The Saint Louis Zoo is a founding member of the Madagascar Fauna and Flora Group (MFG) and has been working with its partners on wildlife conservation at Parc Ivoloina and Betampona Natural Reserve in eastern Madagascar since the late 1980s.

While Betampona is home to 11 distinct species of lemurs, one of the most crucial goals of the Center for Conservation in Madagascar is to protect and stabilize two critically endangered species of lemurs: the diademed sifaka and the black-and-white ruffed lemur.

"We're working so hard to save these critically endangered species," said Lisa Kelley, Ph.D., Executive Director of the WildCare Institute and Center Director. "It's a tricky thing to do. Diademed sifaka are one of the most fragile of primates, as are nearly all sifaka species of lemurs. If the species goes extinct in the wild, it's gone from the world."

To ensure the lemurs and other animals are protected, the Center supports a number of wildlife conservation fieldwork projects, including:

- A genetic management project, which involves ensuring the genetic diversity of lemur populations to enhance their long-term survival and adaptability, along with a translocation project of the diademed sifaka and the black-and-white ruffed lemur in Betampona;
- Plant restoration in the area, leading to the regeneration of native vegetation and healthy habitat for the native animals; and
- Research and conservation of other animal species, including providing grant funding that led to new discoveries of multiple frog species and the ranging behavior and health of carnivores native to the island country.

Most recently, conservationists exceeded their goal to restore 10 hectares of habitat for key endangered lemur species in Betampona Natural Reserve. This work was done under the auspice of the MFG. Funding for this work also came through a donor of The Living Earth Collaborative, which is a formal partnership between the Saint Louis Zoo, Washington University in St. Louis and the Missouri Botanical Garden.

Reforestation efforts in Madagascar.

In addition, conservationists developed new techniques to propagate endangered rosewood species using air layering to supplement the difficult process of seed collection and nurturing. With air layering, new plants are propagated by making a part of a plant stem grow roots while still attached to the main plant. The newly rooted section is then removed and planted separately. In total, 3,600 trees were produced at Betampona across seven rosewood species through air layering and seed collection, and 298 trees were planted at Parc Ivoloina to provide a safety-net genetic population.

The Zoo also supported the MFG by sending Saint Louis Zoo Facilities Management and Primate Care staff to Parc Ivoloina Zoo to help renovate lemur habitats in the park's zoo facility. The team provided uniforms and tools to the zoo staff and trained them in specialized carpentry, such as welding, to build and renovate without having to hire specialists in the future.

A diademed sifaka rests in the treetops in Betampona National Reserve.

Conservation Work Seeks to Understand Biodiversity in Urban Setting

The Saint Louis Zoo's worldwide focus on wildlife conservation extends to animal health and habitats in its own backyard. The Saint Louis Zoo Institute for Conservation Medicine (ICM) is a member of the Forest Park Living Lab (FPLL), a conservation study in one of America's greatest urban parks.

Along with its partners, the ICM studies 20 wildlife species found in Forest Park, researching habitats, movements and diseases in order to better understand wildlife populations and health in an urban setting while increasing public engagement with urban ecology and biodiversity.

"It's important that we as urban dwellers understand the biodiversity and the suite of other animals that share our environment," said Sharon Deem, DVM, Ph.D., DACZM, ICM Director and a principal investigator of the FPLL. "We want St. Louis folks and the 15 million people who come to Forest Park each year to understand that this is home not just to humans."

The ICM and its partners seek to understand urban wildlife by following animals with VHF trackers and/or GPS telemetry devices. They also conduct health studies and monitor diseases, animal deaths and environmental impacts. As more animals are brought into the study, they receive a complete health exam in addition to tracking technology. The data from each tracked animal provides a unique story. The ICM team has also invited thousands of children and adults into the woods for safaris, searching for box turtles and other animals, helping to raise awareness of biodiversity and how animal health is important for everyone's health.

Along with ICM, partners in the FPLL include Forest Park Forever, National Great Rivers Research and Education Center, Saint Louis University, Washington University in St. Louis and World Bird Sanctuary.

Below, from left to right: A red-tailed hawk with a solar GPS tag, a snapping turtle with a VHF tag and an opossum receiving a health evaluation.

Saint Louis Zoo Institute for Conservation Medicine team members Dr. Stella Uiterwaal, Dr. Sharon Deem and Jamie Palmer give Solar, a Forest Park coyote, a health evaluation before placing a GPS collar on her. Data provided from these collars help experts learn about the secret lives of urban coyotes.

Protecting Africa's Great Apes and Old-Growth Forest Habitats

Deep within a remote, old-growth forest in the northern Republic of Congo, communities of chimpanzees and gorillas communicate and live together in social groupings. More than two decades of conservation work by David Morgan, Ph.D., and Crickette Sanz, Ph.D., has led to new insights to help preserve these animals and their habitats.

"Goualougo is the only site with habituated chimpanzees and gorillas in the same forest," Dr. Morgan said. "One of the major aspects of our work is documenting that they not only interact with each other, they know each other and have long-lasting relationships. People come out specifically to see chimps and gorillas in the same tree at the same time."

When Drs. Morgan and Sanz began their conservation work in the Congo Basin over 25 years ago, little was known about the western lowland gorillas and central chimpanzees. But their research and conservation efforts have changed the world's understanding of these species' culture, habitat use and behavior, while also protecting the animals and their environment, and growing local capacity to carry on this important work.

Dr. David Morgan in Congo.

Dr. Morgan is a research fellow at the Lincoln Park Zoo, and Dr. Sanz is an anthropology professor at Washington University in St. Louis. The two co-founded the Goualougo Triangle Ape Project (GTAP) in 1999 to preserve wildlife in the Congo Basin and study the apes, the ecosystems and the forces that threaten their survival. Since 2004, the Saint Louis Zoo has collaborated on research with GTAP and provided them financial support, including funding three Congolese staff members in research and data management. The Zoo's support increased in 2019 with the creation of the Saint Louis Zoo WildCare Institute Center for the Conservation of Congo Apes. GTAP's research takes place at the Goualougo and Mondika field stations, two remote areas in pristine forests mostly devoid of human inhabitants. Drs. Morgan and Sanz and other conservation partners successfully lobbied the government of the Republic of Congo to include these two sites into the Nouabalé-Ndoki National Park (NNNP) in the Sangha Trinational, a protected UNESCO (United Nations Educational, Scientific and Cultural Organization) World Heritage site in the Congo Basin. Goualougo, home to the GTAP, was added to NNNP in 2012, and the Djéké Triangle, site of the Mondika Gorilla Project, became part of the park in 2023. The park is home to many threatened animals, including western lowland gorillas, chimpanzees, forest elephants and other large mammals, plus more than 300 bird species and 1,000 plant species.

"Historically, this area had a low human population and high numbers of great apes, chimpanzees and gorillas," Dr. Morgan said. "There was great emphasis on our part to understand the apes in this region because we believed they would have different social systems, different cultures, tool-using repertoires and different habits than chimpanzees and gorillas in east and west Africa."

GTAP's research has unveiled a greater diversity of interactions between these two ape species than previously thought. On many occasions, chimpanzees and gorillas feed in close proximity and engage in a range of social interactions, including social play, sexual interactions and spread of information. GTAP's research also revealed the central chimpanzees are the most complex tool-using chimps in all of Africa.

Although Drs. Morgan and Sanz now reside in St. Louis, they lived full time in the Goualougo Triangle from 2000 to 2010. While working on their doctorate degrees, they spent almost every day in the field with the apes, collecting data alongside Congolese research assistants. Their early work also involved overcoming local doubt about the research and convincing local Congolese to work in such a challenging, remote location. No roads exist within the NNNP. Goualougo's research camp can only be reached by driving to the park border, crossing the Ndoki River by dugout canoe and hiking five or six hours to the site. The Mondika research site is closer to the park headquarters, requiring only a two-hour walk.

"We've overcome many obstacles and issues to be where we are now," Dr. Morgan said. "We can hire people who want to work for the project, whether they're from a university or local villages. At each of these field sites today, there are roughly 25 people employed by the projects with permanent jobs and salaries where otherwise nobody would be, except possibly hunters or logging operations, had the area not been included into the NNNP."

A gorilla family in Congo.

Over the years, the duo's conservation activities have improved the livelihoods of the communities through capacity building and employment as research staff, field monitors, tourism guides and university positions.

"We've slowly reduced our amount of time there, but we've built up the Congolese capacity to run these sites, every day, full time," Dr. Morgan said. "These are permanent jobs, a long-term investment in developing the sites and careers for those interested in conservation."

When they return to the Congo, Drs. Morgan and Sanz's work involves meeting with site managers, research assistants, conservation partners, the local logging companies, the government and donors for on-site visits. They also spend time in the field with the research assistants and trackers participating in data collection. They also accompany graduate students from Washington University in St. Louis, overseeing their data collection, and working with the Congolese on personal projects.

Much remains to be learned about these unique ape communities and the biologically diverse forests they live in, Dr. Morgan said. In addition, discussions are in the works to possibly transform a research site like Mondika into a sustainable, international gorilla tourism destination, providing an educational window to the next generation of wildlife enthusiasts and conservationists.

Zoo's Facilities Management Team Builds Capacity in Madagascar

Sometimes we take for granted the resources within reach for animal care in the United States. Those advantages came into close focus for two members of the Saint Louis Zoo's Facilities Management team when they journeyed to a zoo in Madagascar.

Tom Sehnert is the Zoo's Director of Maintenance and Derek Strunk is Manager of Special Construction and Welding. In 2023, the duo spent four weeks at a zoo in Parc Ivoloina helping rebuild a quarantine structure that had fallen into disrepair and training park staff to continue making facilities improvements long after they left.

The Ivoloina Zoo sits on four hectares within Parc Ivoloina, a 282-hectare forestry station. The park is home to several critically endangered lemur species in Madagascar, the only nation in the world where lemurs live in the wild. At the park's zoo, some animals live in enclosed habitats, while others roam free through the trees. The Saint Louis Zoo is a founding partner and ongoing collaborator with the Madagascar Fauna and Flora Group, which operates the park.

Sehnert and Strunk's trip began with three days of travel, laden with five suitcases full of tools and equipment, each weighing between 50 and 70 pounds. After lugging their suitcases through airports and overland in Madagascar, the last leg of the journey involved a long walk to the entrance to Parc Ivoloina.

Tom Sehnert, Saint Louis Zoo Director of Maintenance, observes welding techniques.

"We're a little bit spoiled in America. In Madagascar, everything had to be carried into the park. The vehicle only got you so far," Sehnert explained. "The suitcases were very heavy, and we'd been struggling with these things for three days as we traveled, and the park staff just said, 'we'll come pick them up, no problem.' They each grabbed a case and threw it on their shoulder like it was a pillowcase full of feathers. They knew it was heavy, but they don't really have another way of doing stuff like that. That's just part of their life."

Before their trip, Sehnert and Strunk worked with the team in Madagascar to determine the park's needs and plan their trip. The most pressing need was the quarantine space. The zoo was at capacity and lacked additional space for animals rescued from the pet trade, injured animals needing rehabilitation or even a temporary location for animals when their own spaces were being repaired.

"They don't have electricity or running water in the park, so it was quite a tall task," Strunk said. He and Sehnert gathered tools, personal protective gear like safety glasses and gloves, and equipment needed for a large welding project. Strunk researched welding machines designed to work in remote areas and discovered Austrian company Fronius International, which donated a battery-powered welding machine and a crate full of supplies for the project.

The Zoo's team worked with two maintenance workers at Parc Ivoloina and a translator. They taught the park staff how to weld and assisted in rebuilding the structure.

"It was difficult not having access to anything except the things we brought and the generator we used to recharge the welder or run a few power tools," Strunk said. "If the generator ran out of fuel, sometimes we were waiting a day or two for somebody to go into town for fuel. It was very difficult, but very rewarding. I wouldn't trade it for the world."

The Saint Louis Zoo team trains Ivoloina Zoo staff to use new welding equipment.

The language barrier was a challenge that seemed easier to overcome than first imagined.

"Between the translator and the fact that the two technicians were skilled in their own right and with their own methods, we did work quite seamlessly," Sehnert said. "At times, we weren't even really talking. It was hand gesturing and seeing what was going on right in front of you."

Beyond the physical work, the bigger goal was to build capacity for future work.

"Our intent was to train and work with the park staff, so when we left, we not only left behind tools and equipment to carry on, but we also started building that knowledge within the two technicians working at the park," Sehnert said.

After Sehnert and Strunk returned home in 2023, the park's crew continued using the skills and tools they gained, building shift doors within habitats so animals can be temporarily isolated in one section of a structure and a catch cage for capturing an animal and fitting them with a telemetry collars for ongoing monitoring in the wild.

Sehnert and Strunk also returned to Parc Ivoloina in August 2024 to continue their partnership with the Malagasy maintenance crew. Their agenda included more welding repairs, building enrichment structures and animal feeders, completing plumbing repairs, and providing guidance on overall facility planning and management. The Zoo's Facilities Management team plans to travel to Parc Ivoloina annually for the next three or four years to continue their progress and training. Both Sehnert and Strunk emphasized the importance of skilled trades in protecting animals worldwide.

The Parc Ivoloina maintenance team (from left to right): Fanu; Eric, the team's translator; Saint Louis Zoo Director of Maintenance Tom Sehnert; Laurent; and Saint Louis Zoo Manager of Special Construction Derek Strunk.

"Conservation at home and abroad is very important to the Saint Louis Zoo," Sehnert said. "Facilities Management's ability to participate in a capacity-building program with the WildCare Institute shows that conservation is truly a community effort. All of the Zoo's departments and their employees have a role in our mission, even the ones most people outside of the organization wouldn't normally associate with animal care."

Decades-Long Conservation Work Brings Oryx Species Back From Extinction in the Wild

In wildlife conservation, change doesn't happen overnight. Success is measured in large and small steps taken over time that gradually shift the tide toward the positive. For Tim Woodfine, CEO and founding board member of Sahara Conservation, a partnering organization with the Saint Louis Zoo WildCare Institute, it took decades working in northern Africa to bring a species back from extinction in the wild.

"It's not often we celebrate a species becoming endangered, but when it's going in the right direction, then we're doing well," he said.

In December 2023, the International Union for the Conservation of Nature Red List reclassified the scimitar-horned oryx from "extinct in the wild" to "endangered." The change was accomplished through a collaborative initiative between the Environment Agency of Abu Dhabi and the Government of Chad, implemented by Sahara Conservation with the support of partners around the world such as the WildCare Institute's Saharan Wildlife Recovery Center.

Scimitar-horned oryx, no longer listed as extinct in the wild due to conservation efforts.

An estimated 1 million scimitar-horned oryx once migrated across the Sahel and Saharan region, but overhunting, severe droughts and habitat loss led to their extinction in the wild by the 1990s. Woodfine became involved in the plight of the oryx after working on initiatives to re-establish the species in protected areas in Tunisia. At the time, international conservationists and representatives of range states were meeting to develop an action plan to conserve the scimitar-horned oryx, addax, dama gazelle and other endangered Sahelian and Saharan species.

"The Sahara was under-resourced, overlooked and little understood, because most of the conservation dollars and attention was going to sub-Saharan Africa," Woodfine said. "Yet, there was a disproportionate number of threatened species in the region. Some of the world's most endangered, large mammals existed in the north of Africa."

Woodfine and others committed to restoring and protecting these threatened species formed the Sahel and Sahara Interest Group, which has continued as a collaborative and information-sharing forum for the last two decades. Sahara Conservation came about in 2004 as a result of those connections, with the Saint Louis Zoo as a key partner from the outset. Woodfine and his collaborators found common ground with governmental authorities and local communities and built relationships that helped move the work forward.

"I felt very motivated by many of the people I met within these range states," Woodfine said. "There were people who had a very strong desire to protect their own environments and to safeguard some of these remaining populations of threatened species."

Tim Woodfine

Sahara Conservation's earliest work included surveys of key landscapes and wildlife populations to inform conservation planning across the region. Since 2008, Sahara Conservation has spearheaded international efforts to develop and deliver an ambitious strategy for the restoration of the scimitar-horned oryx and select a suitable reintroduction site. A series of workshops and feasibility studies followed, resulting in the selection of the vast, remote Ouadi Rimé-Ouadi Achim Faunal Reserve in central Chad for the reintroduction program, while a genetic "world herd" of scimitar-horned oryx was established in Abu Dhabi with animals from zoos in the United States, Europe and the Middle East.

"Zoos like the Saint Louis Zoo and others have played an essential role in safeguarding that genetic base and providing source animals for reintroduction," Woodfine said.

The journey taking animals to the reserve is not an easy one. The landscape is hot, dry and harsh. Animals are loaded into crates, flown thousands of miles in large military aircraft to a remote airfield in Chad, followed by an hours-long journey by vehicle across challenging terrain following tracks instead of roads. At the reserve, the animals are maintained in facilities to help them acclimate to their surroundings. They are fitted with satellite telemetry collars and are eventually released into the wild and monitored.

"The program has been a tangible success," Woodfine said. "By the end of last year, there were several hundred scimitar-horned oryx living free in Chad, most of which had been born in the wild."

A return trip to Chad last November underscored the impact of his life's work. Sahara Conservation had invited the Chadian Minister of Environment and local community leaders to meet at their base camp in the Reserve as they welcomed a new group of scimitar-horned oryx and addax, another threatened species of desert antelope.

"The pride with which people spoke about the return of these animals was absolutely palpable," Woodfine said. While in the field, the group encountered a herd of camels and nomadic pastoralists. The Minister met with the leader of the nomadic group and discussed the national and local responsibility to look after the environment for the sake of all species and people.

"It was a great point of motivation for saying, 'everybody's on the same page here,'" Woodfine said. "But that's not to say these things are easy. Conservation is a journey. It's not just linear success. There will be bumps in the road. We have to think about the trajectory; are we genuinely going in the right direction? And I think that's certainly the case with what we achieved not just here, but in other parts of the region as well."

Primate Keeper Shares Specialized Knowledge of Endangered Lemur

Emma Leadbetter's journey to Madagascar might never have taken place if it weren't for a children's show featuring a talking lemur.

"When I was a kid, I watched 'Zoboomafoo' and became obsessed with primates and lemurs," said Leadbetter, Saint Louis Zoo Primate Keeper. The children's show featured zoologist brothers and a puppet lemur. "When I went to college, I designed my degree for zoology and anthropology and got a minor in French so I could communicate in Madagascar if I ever traveled there. I knew for years that I wanted to travel to Madagascar at some point."

That point in time came sooner than Leadbetter imagined when she earned one of the Saint Louis Zoo WildCare Institute's Dexter Travel Grants — funding that pays for Zoo team members' travel expenses for fieldwork. The grant covered a two-and-a-half-week trip to Madagascar in August 2023, where Leadbetter worked with keepers in lemur care at the Parc Ivoloina Zoo. Her trip overlapped a visit by two members of Saint Louis Zoo's Facilities Management team who assisted Parc Ivoloina's team with a welding project. The Saint Louis Zoo has been a longtime supporter of Parc Ivoloina through the Saint Louis Zoo WildCare Institute's Center for Conservation in Madagascar and is a founding member of the Madagascar Fauna and Flora Group, the nonprofit that runs Parc Ivoloina.

At the Saint Louis Zoo, Leadbetter cares for sifaka lemurs and other small primates, so when she arrived in Madagascar, she was asked to work with a sifaka lemur named Calypso who had been rescued from a hotel.

"They had never had a sifaka at their zoo, and none of the keepers really knew the care needed with this species of lemur," Leadbetter said. To help acclimate the animal, Leadbetter would release the lemur from its habitat each day and monitor it as it explored its natural world.

"He would have free range for a couple of hours, and I would watch him, make sure he was doing okay up in the trees," she said. "There were a couple of times I climbed up in the trees to help him get up higher because he was a juvenile and had been kept in a hotel and didn't know how to be a lemur in the wild. He was learning how to co-exist with the free-ranging lemurs in the forest."

Leadbetter also helped in other areas. She helped with weekly washing of tortoises and built shift doors out of bamboo. The sliding doors are used to isolate animals for short periods by closing off part of an enclosure.

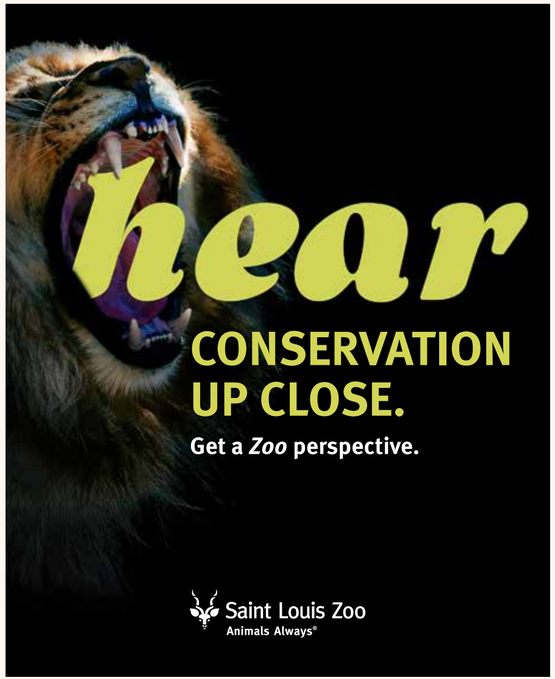
"The main thing I did was collaborate with their keepers and give them ideas and techniques to take care of a sifaka because they have very specific care needs," she said. Leadbetter also learned from her hosts, gaining new enrichment ideas for activities and objects to stimulate the primates under her care.

While the Saint Louis Zoo houses several species of lemurs, the animals are only found in the wild in Madagascar, and 98% of the known lemur types are on the brink of extinction. Being able to see the animals in their natural habitat was an incredible experience.

"We stayed in a dormitory in the forest, and the zoo was a three-minute walk away," Leadbetter said. "Your walk to work for the day included lemurs jumping around you and things like that. It was amazing getting to see that."

As for when she's returning to Madagascar, Leadbetter said, "I have no idea, but I hope soon."

Saint Louis Zoo Primate Keeper Emma Leadbetter and sifaka lemur Calypso.



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