



San Diego Zoo Wildlife Alliance
JOURNAL

SEPTEMBER/OCTOBER 2022



**Safeguarding
Essential Asian
Rainforests**

September/October 2022 Vol. 2 No. 5

Journey Through Our Conservation Work This issue of the *San Diego Zoo Wildlife Alliance Journal* focuses on the Asian Rainforest hub. To learn more about our collaborative conservation programs around the world, including our wildlife care at the San Diego Zoo and San Diego Zoo Safari Park, visit sdzwa.org.

Photos by: Ken Bohn/SDZWA



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All the Eggs in One Basket

For milky storks, communal living is key. And San Diego Zoo Wildlife Alliance has just the place to protect this precious population.

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Balancing Act

In West Sumatra, competition for resources can make it tricky for tigers and people to coexist. SDZWA is teaming up with local entities to help keep the situation stable.

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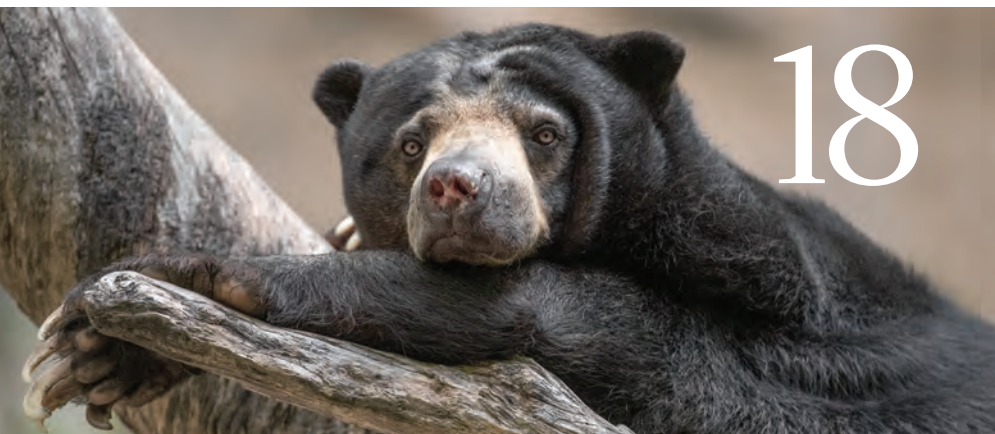
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Visualize It

Even the botanical world has its share of hunters. Along with the usual diet of sunlight, soil, carbon dioxide, and water, carnivorous plants like a little meat on the side. And they have amazing ways of attracting and trapping it!



San Diego Zoo Wildlife Alliance JOURNAL

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Conservation Here and There: Asian Rainforest



With old growth canopies and lianas that spread from tree to tree, Asian rainforests are among the oldest on Earth, and are home to thousands of wildlife species. Once covering most of the continent, Asian rainforests are facing unprecedented challenges, and are rapidly changing. Together with partners from countries across Asia, we are creating innovative conservation solutions to preserve species that inhabit this complex ecosystem, while fostering coexistence with wildlife through education and outreach. In this issue, we explore several of these initiatives that are underway in our Asian Rainforest conservation hub.

Conservation starts with people, and it is ignited when we connect with wildlife. Through the support of allies like you, we are developing educational resources to inspire conservation of key species, including tigers in West Sumatra and hornbills in India. We look for ways to collaborate with local communities, support conservation, and bring cutting-edge technologies to the field. Using the expertise we gain in wildlife care here at our two “front doors”—the San Diego Zoo and San Diego Zoo Safari Park—we lead as first responders for wildlife with our signature skills, and add to the transformative power of conservation.

At times, conservation comes down to teamwork and our collective ability to meet the moment for wildlife. Last year, in a last-ditch effort to propagate one of the most endangered storks of the Asian Rainforest—milky storks—in protective, managed care, the Association of Zoos and Aquariums resolved to bring the entire North American population together in one place: the Safari Park's Bird Breeding Center. Here, our wildlife care specialists and teams of scientists are diving into this conservation initiative headfirst. The birds' expansive habitat at the Safari Park offers a climate-controlled environment with tall trees, grass, and natural ponds where crayfish live, providing optimum conditions for milky stork reproduction. Although we have a long way to go, we see glimmers of hope in the behaviors shown by the milky storks we're caring for, and the hatchlings they've welcomed since their arrival.

We continue to celebrate the 50th anniversary of the Safari Park, and we hope you will join us to relive your favorite experiences and connections with wildlife. Walking through the lush bamboo forests at Tull Family Tiger Trail and catching the mesmerizing gaze of a Sumatran tiger, coming face-to-face with rhinos and giraffes on a safari experience, or roaming alongside kangaroos and wallabies through the grasslands and marshes of Walkabout Australia, you're sure to experience inspiring and life-changing moments.

Now, join us on an adventure through the Asian Rainforest—in this issue of the *Journal*.

Onward,

Paul A. Baribault
President and Chief Executive Officer

Asian Rainforest

The ancient forests of Southeast Asia are places where an abundance of wildlife can flourish. But illegal logging and non-sustainable agriculture have destroyed and degraded large swaths of forest, which means that wildlife like orangutans, sun bears, and an SDZWA key species—the Sumatran tiger—now live in fragmented populations. We are collaborating with local conservationists to protect the region’s unique wildlife.

91 The tarsier, a tiny primate, can hear ultrasound frequencies up to 91 kilohertz—higher than any other terrestrial animal.



148 Strangler figs can grow to 148 feet (about half as tall as the Statue of Liberty!).

3,800

The estimated number of bird species living in the Asian rainforest.

<400 As of 2022, there are believed to be fewer than 400 Sumatran tigers left in the world, outside of managed care.



up to 12,000
The weight, in pounds, that male Asian elephants can reach. They are the largest inhabitants of the Asian rainforest.



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Wildlife Alliance**

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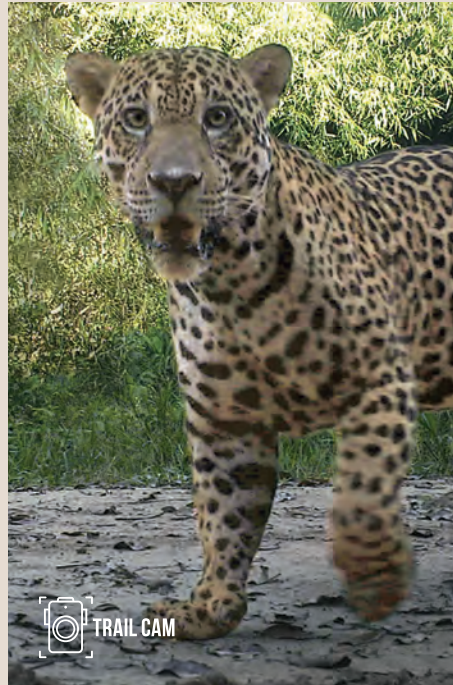
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San Diego Zoo Wildlife Alliance (SDZWA) protects and restores nature in eight conservation hubs on six continents. Below are recent discoveries and progress from around the world.

Machine Learning Milestone

Using machine learning (ML), SDZWA's Conservation Technology Lab has been working on methods for performing automatic species detection on photographs taken by SDZWA's trail cameras around the globe. The ML process involves identifying where wildlife are in images; cropping around the wildlife; and identifying the cropped species. The output is a list of species that the ML system has detected. The images can then be manually checked by volunteers, using the citizen science platform Zooniverse, to confirm whether the ML correctly identified them. Recently, our team modified our Zooniverse process using this ML step to greatly improve efficiency, and the project hit a milestone when it took only 22 days for volunteers to classify 14,500 images; a comparable dataset in 2019 took almost 6 months.



Testing Tortoise Microsensors

SDZWA wildlife care and conservation science teams are working to see if we can learn more about desert tortoises *Gopherus agassizii* with the aid of a novel microsensor. The teams are testing the sensor with tortoises under our care to determine if these devices can provide data that could be important for conservation, wildlife care, and welfare. The sensors (pictured), about the size of a large multivitamin, are temporarily attached and simultaneously record movements in three dimensions and external temperatures. This information could be important in documenting the thermal landscape that individuals perceive and select, as well as tortoise activity budgets, and how these change in response to disturbance or perceived threats.



tant in documenting the thermal landscape that individuals perceive and select, as well as tortoise activity budgets, and how these change in response to disturbance or perceived threats.



'Alalā Reintroduction Sites

The 'alalā (Hawaiian crow) *Corvus hawaiiensis* is currently extinct in the wild, and SDZWA cares for the entire remaining breeding population (about 120 birds) at our two bird conservation centers in Hawai'i. Our conservation scientists joined partners in Hawai'i to select sites for reintroduction of 'alalā to the forests. We helped rank potential sites by considering habitat quality (such as forest structure and availability of native plants for nesting and foraging), and the logistics involved in reintroducing and monitoring, among other factors. Through a series of virtual and in-person field trips, we applied this process to forest areas across Maui and Moloka'i, and helped narrow site options. Moving forward, our partners will be leading an environmental impact assessment. Together, we aim to reintroduce the next group of 'alalā in 2023 or 2024.

Lemur Reference Genomes

The genomes of eight lemur species were sequenced for assembly of new reference genomes. Lemurs are the most threatened group of mammals on Earth: 98 percent of lemur species are endangered. As part of Illumina's iConserve initiative to advance the conservation of endangered species using genomics, SDZWA has partnered with the University of Antananarivo in Madagascar and the Universitat Pompeu Fabra in Spain to lead the most comprehensive genomics study ever done on lemurs. These genomes will provide insight into the genetic signatures of endangerment and will be foundational, publicly available tools for advancing knowledge of these under-studied primates.



PHOTOS BY (TOP LEFT) SDZWA, (TOP RIGHT) KEN BOHN/SDZWA, (BOTTOM RIGHT) TANNY SPRATT/SDZWA, (BOTTOM LEFT) KEN BOHN/SDZWA, LOCATION EDWARDS AIR FORCE BASE/DESERT TORTOISE HEADSTART FACILITIES

Q What is the coolest thing about your job?
 Taking all the years of wildlife care and field program experience and translating that to helping build headstart programs for endangered species, and being able to help reintroduce wildlife—from sea turtles to crocodiles, to Fijian iguanas. Then, also helping be part of large redesign and construction projects here, including Elephant Odyssey, Reptile Walk, Komodo Kingdom, and now Wildlife Explorers Basecamp.

Q What book or film influenced you or made a strong impression?
 The novel *Never Cry Wolf* by Farley Mowat, a Canadian author and environmentalist, made a huge impression on me as a child. I grew up in Canada, and although my interests have always been reptiles and amphibians, this true story about a field biologist championing species in the far north was very inspiring to me—and actually helped me decide early on that I had to be involved in conservation.

Q What is your favorite animal? Why?
 I have so many favorites through the whole Animal Kingdom, but I can narrow it down to Fijian iguanas (pictured), slender-snouted crocodiles, Pacific giant salamanders, and lungfish. I adore unique species, and especially those that generally are the most misunderstood. I appreciate having opportunities to help share amazing facts and stories about these species, and hope to help others empathize with wildlife.



Kim Gray

As curator of herpetology and ichthyology for SDZWA, Kim Gray helps develop best practices for care, breeding plans, and habitat support for reptiles, amphibians, and fish.



Q What was a turning point or defining moment in a project or program you've worked on?
 I have been able to help work on a number of headstart programs for reptiles and amphibians, where young animals are raised under managed care and subsequently reintroduced into their native habitats. These programs are critical for assuring some species get the help they need to persist in their native habitats. For me, the defining moment of each has been when all the various details and years of hard work come together, and we are able to reintroduce or translocate wildlife into the native habitat.

Q What has surprised you about working with SDZWA?
 No two days are ever the same. One day, I can be in meetings related to combating wildlife trafficking, then helping state wildlife agencies brainstorm native reptile conservation measures for drought preparedness, and then completing permits to be able to transfer vipers to a zoo in the United Kingdom in support of a conservation breeding program. The next day, I might be on a 3 a.m. virtual conference call to talk about the progress of baby crocodiles with colleagues at a headstart facility in West Africa, before making a quick update to wildlife records for one of the Species Survival Plans I manage. Every day is an adventure!

Q What do you see as the future of wildlife conservation?
 Partnerships. In my years of experience, the most successful wildlife conservation initiatives have been those done in collaboration, and we certainly have some amazing Alliance partners we have the privilege to work with.

Q Who or what inspires you?
 I think nature itself inspires me the most. We see habitat loss from clear-cutting to massive-scale habitat damage from cyclones and fires—and yet, somehow, nature still persists. Sometimes it just needs a helping hand—for example, with headstart and assurance populations—but given enough time and support, it can bounce back and thrive.

Visionary

Dr. Kurt Benirschke's historic impact on conservation biology continues to be felt around the world.

PHOTOS BY: SDZWA

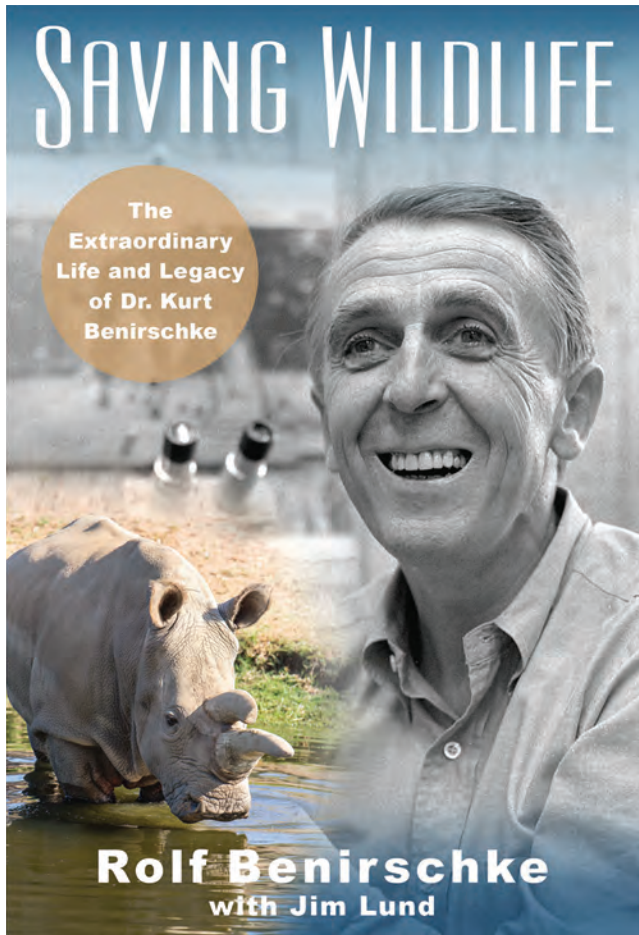
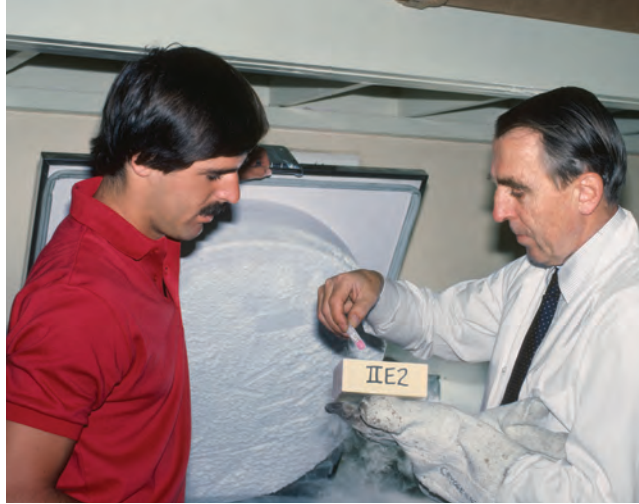
SAVING WILDLIFE:

The Remarkable Story of a Conservation Pioneer

Physician scientist. Wildlife conservationist. Visionary leader. Family man. The inimitable Dr. Kurt Benirschke (“Dr. B”) was a trailblazer—passionate about gathering and sharing knowledge to make the world a better place for both people and wildlife. Whether he was sneaking vital veterinary medicine through Checkpoint Charlie into East Germany or flying through a raging thunderstorm in a single-engine plane to pick up chromosome samples in Paraguay, Dr. B was dedicated to solving problems and exploring ideas that would transform both human and veterinary science.

Saving Wildlife: The Extraordinary Life and Legacy of Dr. Kurt Benirschke tells Dr. B's inspiring and adventure-filled story. Written by his son Rolf Benirschke, former NFL All-Pro placekicker, the book describes how Dr. B's insatiable curiosity took him from war-torn Germany to the United States to begin his extraordinary medical career. Intrigued by twins, the placenta, and the study of chromosomes, Dr. B secured a pathology residency at Harvard University and became the chief resident at Harvard's second-largest teaching hospital. His curiosity about humans and





Precious cell lines: Top: Rolf Benirschke watches as his father stores living cell lines in a deep-freeze that has come to be known as the “Frozen Zoo®.” A new book by Rolf shares details of Dr. Benirschke’s life and his work.

wildlife next led him to Dartmouth College’s medical school in 1960, where he chaired the pathology department, and then finally to the University of California, San Diego (UCSD) in 1970 as a founding faculty member of the then-new medical school.

The close proximity to the San Diego Zoo allowed Dr. B to delve further into the world of endangered wild-

life while still working at UCSD. He joined the Zoo’s newly formed research committee and then founded the Zoo’s Center for Reproduction of Endangered Species in 1975, building a team of scientists that would have an enormous impact on critically endangered, threatened, and vulnerable species such as the Przewalski’s horse, California condor, giant panda, southern white rhino, Chacoan peccary, and many more. Dr. B also began collecting tissue and genetic DNA samples from rare and endangered animals. These early collections would become the foundation of the “Frozen Zoo®,” now part of San Diego Zoo Wildlife Alliance’s (SDZWA) Wildlife Biodiversity Bank.

Dr. Kurt Benirschke spent his life gaining—and generously sharing—knowledge. In doing so, he made a historic impact on modern medicine and conservation biology that continues to influence our world today. Yet, as Oliver Ryder, Ph.D., director of conservation genetics for SDZWA, says, “All of Dr. B’s scientific accomplishments don’t address the full measure of this remarkable man.” In his foreword to *Saving Wildlife*, Ollie Ryder explains: “It takes the insightful view of his offspring—in this case, his youngest son, Rolf—to bring the totality of this unique individual to light. Interwoven in the pages of *Saving Wildlife* are personal reflections that reveal an amazing life and the earned mutual respect, appreciation, and genuine love forged between a father and son.”

Saving Wildlife, published by San Diego Zoo Wildlife Alliance Press, can be purchased at ShopZoo.com and in gift shops at the Zoo and Safari Park.

