

# Saving Species™

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SAN DIEGO ZOO GLOBAL INSTITUTE FOR CONSERVATION RESEARCH



## Defeating Wildlife Trafficking Involving Communities Is Key

Understanding what drives this illegal trade depends on campaigns that engage with local communities about this global crisis. When the buying stops, the killing will stop.



# DEFEATING WILDLIFE TRAFFICKING

\\ By **Allison Alberts**, Ph.D., Chief Conservation and Research Officer

Tens of thousands of plant and animal species are threatened by the illegal wildlife trade, now valued at more than \$19 billion a year. At San Diego Zoo Global, we are dead serious about halting wildlife trafficking in its tracks—and we have adopted an organization-wide strategy for how to accomplish it.

We use our influence with policy makers and the public to strengthen legislation that protects species from illegal trade. This includes promoting new technology tools, such as cell phone-based programs for citizens to report poachers and new apps to assist travelers in purchasing only wildlife-safe souvenirs. We use our facilities and expertise to provide sanctuary—and, where possible, repatriation—for plants and animals confiscated by law enforcement.

We also partner to build monitoring and enforcement capacity in countries where we work, with an initial focus in Cambodia, Vietnam, and Laos. At home, we work with the Association of Zoos and Aquariums and the U.S. Fish and Wildlife Service to raise awareness about the threat wildlife trafficking poses to endangered species around the world.

We are committed to sharing poignant messages with our visitors to build empathy and concern for the plight of species impacted by the illegal trade in wildlife and plants. Using the latest social science research techniques, we create behavior-change campaigns that motivate people to act in ways that make a tangible difference for wildlife.

Here we share stories ranging from helping sun bears in Southeast Asia and threatened cacti here at home, to rescuing radiated tortoises in Madagascar and re-wilding elephants impacted by ivory poaching in Kenya and Myanmar. Together, we can make a difference.

## HOW YOU CAN HELP

Our field research teams all over the world rely on the generosity of donors like you to help achieve San Diego Zoo Global's vision to lead the fight against extinction. To learn ways you can help, please call Maggie Aleksic at 760-747-8702, ext. 5762, or email [maleksic@sandiegozoo.org](mailto:maleksic@sandiegozoo.org).

## ON THE COVER

All five rhinoceros species are either threatened or critically endangered, whether in Africa or Asia. Government agencies, nonprofits like San Diego Zoo Global, and other organizations work together to stop wildlife trafficking.



*“There are two main strategies to tackle this crisis: by reducing the supply or by reducing the demand.”*

DAVID O’CONNOR

## STRATEGIES TO END THE TRADE

\\ By **David O’Connor**, Researcher, Population Sustainability

Illegal trade and trafficking of wildlife are among the leading threats to many species across the world. Most people know about the illegal wildlife trade in relation to ivory derived from poached elephant tusks or the trade in rhino horn due to the most highly publicized efforts to eliminate the trade. However, it also affects a wide range of animals and plants, some not as well known, from regions all over the world.

Our work with global partners addresses this devastating trade in both the United States and around the world by harnessing our strengths in conservation science, policy, and communications. There are two main strategies to tackle this crisis: by reducing the supply or by reducing the demand. We actively support the heroic efforts of antipoaching rangers and others in protecting these animals and plants in the wild. In the U.S., enforcement agencies find and confiscate trade items as well as living animals and plants being trafficked, and then we find safe homes for them, often at one of our sanctuaries.

We are also working to reduce demand in many innovative ways. On the front lines in Southeast Asia, East Africa, and South America, we work with key partners and collaborators to develop effective ways to understand consumers’ motivations and desires to purchase wildlife and wildlife products. These can range from trophies, artwork, jewelry, and clothing to traditional medicine remedies.

These efforts began in 2014, when we began collaborating with conservation organizations, universities, and governments in Southeast Asia. By using cutting-edge social science surveys of local communities and social marketing, the goal is to understand the drivers behind consumption. We then use that knowledge to create more effective messages and campaigns to reduce demand for these products that resonate closely with consumers and their cultural norms to end consumption of trafficked products. It is these efforts that will lead to long-term behavior changes, because when the buying stops, the killing will stop. ●



We focus on a number of less well-known trafficked species, such as sun bears and moon bears used for their bile (middle), saiga horns (left) trafficked for medical purposes, jaguars killed for their beautiful coats (right), and giraffes poached for several reasons, including illegal bushmeat.





*“What drives behavior changes in these countries?...Today there is a sense of urgency in combating this problem and implementing the strategic planning needed.”* JENNY GLIKMAN

## CHANGING MINDS, SAVING WILDLIFE

\\ By **Jenny Glikman**, Ph.D., Associate Director, Community Engagement, and **Elizabeth Davis**, Community Engagement Consultant

The story behind the social science aspects of wildlife trafficking in Southeast Asia includes community engagement as well as behavior surveys and their results. What drives behavior changes in these countries? Are alternative livelihoods part of the solution when poachers are involved or bile farms are shut down? Today there is a sense of urgency in combating this problem and implementing the strategic planning needed.

Southeast Asia is in the midst of a biodiversity crisis. Throughout the Greater Mekong Region of Laos, Cambodia, and Vietnam, species are declining at unprecedented rates, with wildlife decimated throughout the region. One of the main drivers of this crisis is widespread demand for animal products throughout the Asian region, which are sought after

for a variety of purposes, ranging from traditional medicine to prestige to food and subsistence.

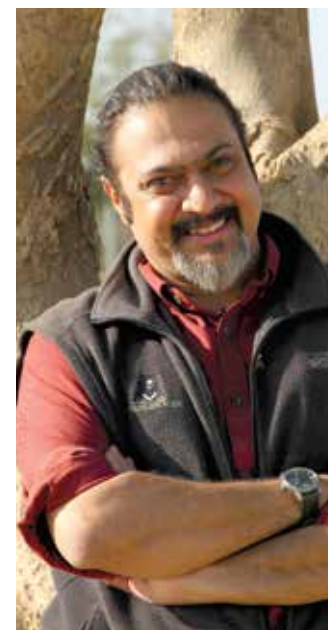
Addressing this issue is challenging, because use of wildlife products in Southeast Asia is often culturally entrenched and accepted as a normal feature of everyday life. Our Community Engagement team approaches demand-reduction efforts from an empathetic viewpoint, using both anthropological and social science methods. This helps us understand complex motivations individuals have for using animal products, as well as which individuals are most likely to use these products or encourage others to use them. With this information, we can develop behavior-change campaigns that are designed to reach consumers and influencers, with appropriate messages for each group. ●

Selling illegal wildlife products is big business for items like artwork, traditional medicines, and clothing. Stopping demand is a priority for law enforcement agencies worldwide.



## PARTNERING WITH CONSERVATION CRUSADERS

San Diego Zoo Global's 2018 Conservation-In-Action Medalists are champions for wildlife in Asia as they rescue animals from the wildlife trade and educate the public about protecting wildlife and habitats.



### WILDLIFE SOS

Over in India, Wildlife SOS was founded in 1995 by Geeta Seshamani and Kartick Satyanarayan, who have devoted their careers and lives to protecting vulnerable species. Rescuing sloth bears forced to “dance” by abusive owners and freeing elephants from inhumane treatment are just some of the ways they improve animals’ lives every day. They work tirelessly to prevent animal cruelty, defeat crimes against wildlife, thwart the illegal trade in wildlife wherever they can, and partner with NGOs, zoos, government and state agencies, police, and volunteers—their work is never done.



### FREE THE BEARS

With his remarkable and dedicated team, CEO Matt Hunt has a goal to protect and enrich bears’ lives throughout the world. This includes the rescue, care, and rehabilitation of hundreds of sun bears and Asiatic black bears (moon bears) from bear bile farms and the wildlife trade. In Laos, Vietnam, and Cambodia, Matt initiated the first studies of wild bears, increasing awareness of their plight around the world. His team founds wildlife centers, trains wildlife law enforcement teams, and creates environmental awareness among local communities.

In Cambodia, we work with Free the Bears on our first campaign to halt the use of bear products for traditional medicine remedies. From our local interviews, we learned who was supplying bear medicine products to neighbors in a rural town, where use increased by 30 percent. It’s important to work with these communities to understand why people buy illegal wildlife products and how to make this socially unacceptable.







*“No one can sit on the sidelines now: we have an important role to play given the diversity of animal species we work with in this fight.” – BRUCE RIDEOUT*

## Forensic Science: OUTSMARTING TRAFFICKERS

\\ By **Bruce Rideout**, D.V.M., Ph.D., Dipl. ACVP, Director, Disease Investigations

The international police agency, Interpol, defines a wildlife crime as the taking, trading, exploiting, or possessing of the world’s wild flora and fauna in contravention of national and international laws. And wildlife crime is big business: the numbers tell the story. Rhino poaching in Africa increased by 7,700 percent between 2009 and 2013; elephant ivory prices jumped 280 percent between 2010 and 2014; and 14.4 tons of pangolin scales were confiscated in Hong Kong in June and July of 2016 alone. Trafficking is now one of the major threats to wildlife, particularly in Africa and Asia. Reversing this trend will require global cooperation and action on many fronts.

One important front is prosecution of poachers and ringleaders of wildlife trafficking networks. But prosecution requires evidence that will stand up in court, which is difficult to gather. That’s where forensic scientists at the U.S. Fish and Wildlife Service (USFWS) Forensics Lab come in. Their job is to find evidence needed for prosecution by linking the victim—a protected species of plant or animal—with a suspect or a crime scene.

Evidence of a wildlife crime can take many forms, but it falls neatly into two categories: eyewitness accounts and physical evidence. Eyewitness accounts are difficult to come by, so prosecutions are often based on physical evidence, which can be anything from blood on a poacher’s snare to woven animal hair in a bracelet,

feathers in a hat, carved ivory, a snake in a bottle of liquor, or even the wood of an expensive classical guitar.

But how do you prove that the woven hair in an African bracelet is from an elephant rather than a domestic animal, or that the blood on a snare is from a protected wildlife species rather than a legally hunted species? Forensic scientists have been working on these challenges for many years and have come up with a number of clever solutions. One of the key innovations is DNA barcoding, allowing scientists to match any tissue sample to the animal species of origin. This is critically important when the animal part might be difficult to identify, such as meat from a bushmeat market.

With poaching and other wildlife crimes on the increase, the USFWS Forensics Lab is growing. California is also getting tough on wildlife crimes, since it has become the second-largest market in the United States for illegally traded ivory products. The California Department of Fish and Wildlife (CDFW) is responding by launching their own forensics lab.

No one can sit on the sidelines now: we have an important role to play given the diversity of animal species we work with in this fight. We work closely with the USFWS Forensics Lab to provide validated specimens for controls in their morphological and DNA tests. Now that CDFW has their own forensics lab, we are assisting them as well. But no one is resting on their laurels—the fight against trafficking goes on.●



DNA barcoding is a laboratory technique that compares a short sequence of DNA from any tissue sample, such as fur or hair, to an extensive DNA sequence database. A match in the database links the sample to the animal species from which it came.

## CONSERVATION GENOMICS: PROVING SPECIES IDENTITY

\\ **Oliver Ryder**, Ph.D., Kleberg Endowed Director, Conservation Genetics

Prosecuting wildlife trafficking involves producing evidence that an illegal act was committed, and often refuting defendants’ statements that an unidentifiable specimen was from a domestic animal. In other cases, knowledge of the location of origin of a confiscated living animal is vital for reintroducing it back into the correct population. Our Frozen Zoo® has contributed DNA samples to solve cases when requested by wildlife agencies. Some examples are identifying if blood on a knife is from a pig, as claimed by defendants, or from a rhinoceros; whether an infant gorilla is an eastern lowland or mountain gorilla; or pinpointing species identification of pangolins.

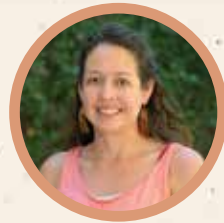


## ZOOHACKATHON: CREATING APPS THAT SNARE POACHERS

\\ **Gabriel Miller**, Ph.D., Senior Scientist, Population Sustainability

San Diego Zoo Global has hosted the third annual Zoonhackathon, an event orchestrated and judged globally by the U.S. Department of State, in which designers, programmers, and engineers gather to create prototype solutions to wildlife trafficking over a continuous 44-hour period. With assistance from 16 volunteers and 12 community partners, our program included tours and talks by our senior keepers who have firsthand experience with wildlife trafficking issues. The winning team, comprising five local professionals, created a tool called Conscious Consumer that educates online shoppers about problematic ingredients and products. San Diego also hosted the first hackathon, when the winning local group from our site developed WildTrack, an app for anonymously reporting poaching-related incidents. A runner-up team also created a website called Safe Souvenirs to educate travelers about illegal keepsakes.





*“Buyers don’t think of where the plants are coming from or the damage being done in removing them from the wild.”*

CHRISTA HORN

# POACHED RARE PLANTS: PUSHED TO THE BRINK

By **Christa Horn**, Conservation Program Specialist, Plant Conservation

In the spring of 2017, a routine search by Mexican authorities uncovered boxes filled with the rare Cedros Island live-forever, *Dudleya pachyphytum* (pg. 8, bottom left). The 4,756 plants had been dug out of their native habitat on a small island off the Pacific coast of Baja California, Mexico. That December, a tip from a suspicious post office patron led to the discovery of over 60 boxes slated for shipment to China, filled with bluff lettuce, *Dudleya farinosa*, a common species found on California coastal bluffs and similar in appearance to its relative on Cedros Island.

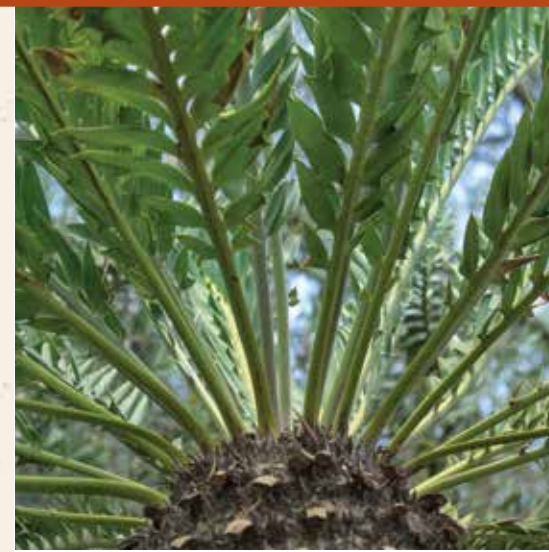
In both cases, local law enforcement officers were surprised to hear of demand in other countries for the beautiful, powdery rosettes. But although the sudden demand for live-forevers may be a new development, plant poaching is nothing new. Succulents like live-forevers—along with cacti, orchids, cycads, palms, and carnivorous plants, as well as some rare timber species—are all heavily impacted by poaching, which pushes some to extinction.

Fortunately, great follow-through by law enforcement led to the return of the bluff lettuce, with California Department of Fish and Wildlife and many volunteers replanting the confiscated plants in the spring. But

not all poaching events can be reversed. Increasing public knowledge, and even knowledge among law enforcement, is key to preventing further poaching. And perhaps confiscated plants can help spread the word.

Many rare plant species are covered under the Convention on International Trade in Endangered Species (CITES) to prevent poaching and illegal trade between countries and help protect species. Of the thousands of CITES-protected plants confiscated at U.S. borders each year, many cannot be returned to their home country, and some can’t even be identified. In these cases, the plants find homes in one of the 84 institutions recognized as Plant Rescue Centers (PRC) by the U.S. Fish and Wildlife Service, including the San Diego Zoo and Safari Park.

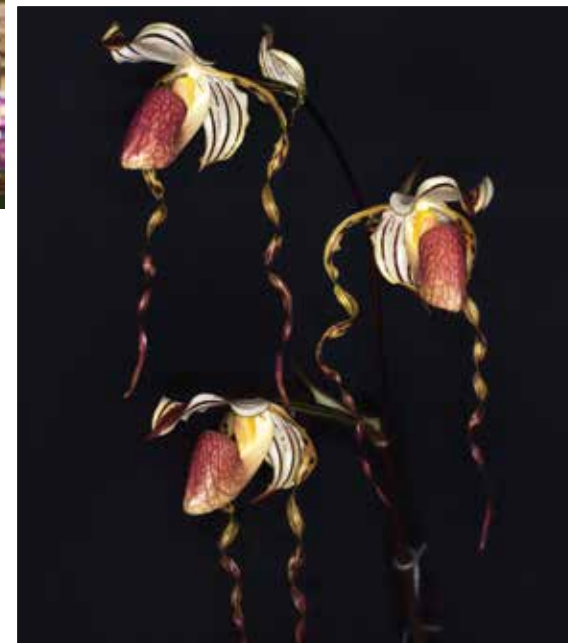
By taking in epiphyllums and Baja cacti at the Safari Park and orchids at the Zoo, San Diego Zoo Global is doing its part to mitigate the impact of global plant trafficking. The confiscated plants are available for research, education, and more. Although the original plants must stay at a PRC, their seeds and cuttings can be shared for further research or restoration. Plants at the Zoo and the Safari Park can help serve as ambassadors for their wild counterparts. ●



Every year, thousands of living plants are confiscated at U.S. borders. Although some species are used for traditional medicines (such as American ginseng) or food (including some orchids), and others make fine woods (such as mahogany), the demand for many is driven by the ornamental market. Serious collectors seek something new or rare to add to their collection, while other plant enthusiasts just keep up with trends. Buyers don’t think of where the plants are coming from or the damage being done in removing them from the wild.



The orchid collection at the Zoo is a hidden treasure with more than 900 taxa. Partially created from confiscations the Zoo receives as a Plant Rescue Center, it gives plants a place to thrive. With plants usually coming in as inconspicuous bulbs, it is often unclear what species has been rescued, so discovering the needs of the plant can be a bit of a puzzle. One such puzzle took 14 years to solve before an unidentified bulb bloomed, with the confiscated plant proving to be a critically endangered lady slipper orchid, *Paphiopedilum stonei* (right). Now they can be propagated to help save it from extinction. We are also part of a project in the island nation of Palau to reduce orchid poaching. Palauans learned propagation techniques for rare orchids like *Dipodium freycinetioides* (top, middle).



Poachers are often out in the field, hoping to collect specimens that meet the changing tastes of buyers. Orchid poachers in particular have been noted for sometimes finding—and depleting—entire populations before they have even been described by science.



Photos by: San Diego Zoo Global; Christy Powell; Zoya Akulova-Barlow



# RADIATED TORTOISE SOS: HEARING THE CALL

\\ By **Brett Baldwin**, Animal Care Manager/Reptiles, San Diego Zoo

Although radiated tortoises have a broad range in southern Madagascar, they are critically endangered because of habitat loss, farming, and the illegal animal trade. When on April 10, 2018, authorities there discovered more than 10,000 radiated tortoises in a home near Tulear, the Turtle Survival Alliance quickly contacted zoos and other organizations to send supplies and assist with animal care. The need was urgent—several hundred tortoises had already died there.

As soon as San Diego Zoo Global learned of the crisis, the response was immediate to assist with this huge problem. Veterinary and herpetology staff were sent along with urgently needed boxes of medical supplies. After 29 hours in flight and several transfers, our team arrived in Tulear.

We learned the tortoises had been moved from the wildlife trafficker's house to a location near Ifaty, 30 miles away, a small French conservation facility called Village des Tortues. Here tortoises were placed in pens based on their size and health, and a small veterinary hospital was set up. Eventually there were seven field teams with

keepers and veterinary staff that came over in alternating 2-week periods, each overlapping a day to train on daily routines and procedures as well as help build and modify pens. Long days followed to treat, medicate, complete life checks, feed, and water tortoises. One of the biggest problems for tortoises was dehydration, so they were given fresh water daily and some needed to soak in tubs.

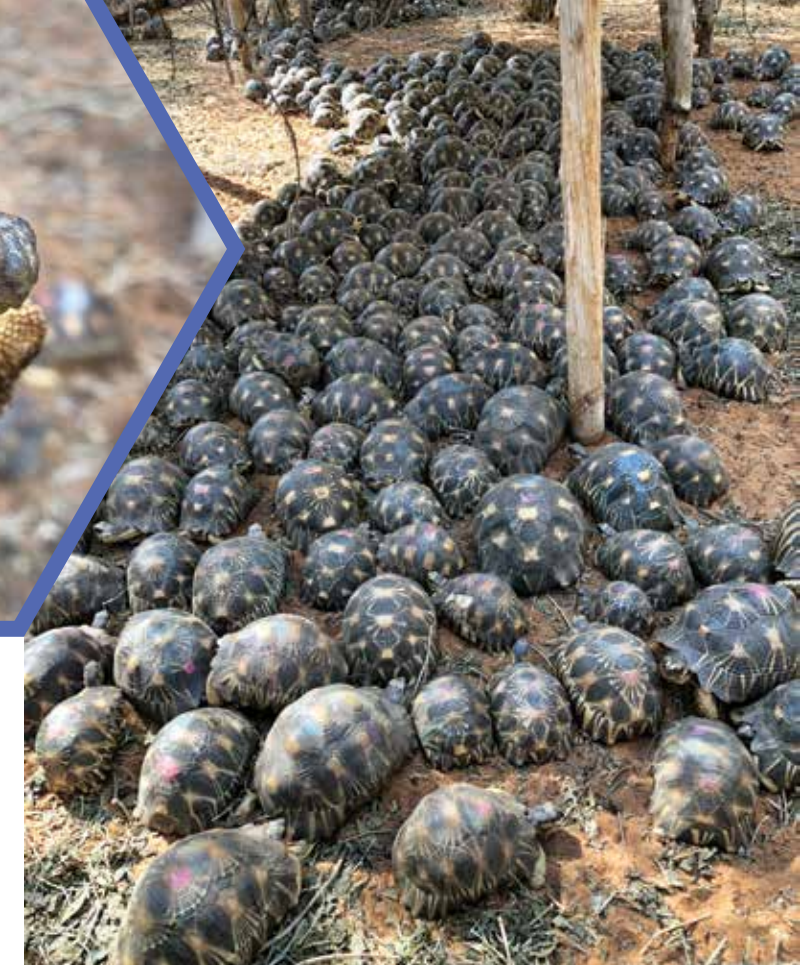
Soon after arrival in Ifaty, I took grueling boat and truck rides to reach Itampolo, much farther south, a remote and barren area of limestone rocks and thorny plants. We began building a clinic and additional pens, because all the tortoises would eventually be moved here. I also joined local villagers hired to dig, mix concrete, move rocks, and build fences—all without power tools and no electricity! Some tortoises were already there, so I also helped with feeding, health checks, and watering them.

Eventually, the remaining 1,724 tortoises were moved to this facility on June 17, 2018. These were Herculean efforts by many dedicated partners, and we will do it all again when we hear the call. ●



*“As soon as San Diego Zoo Global learned of the crisis, the response was immediate to assist with this huge problem.”* **BRETT BALDWIN**

One major obstacle in managing thousands of tortoises was access to water, which was in a deep well. Every day a 5-gallon bucket was hoisted up repeatedly to fill a 55-gallon drum, but the sandy soil made walking any distance with tubs filled with tortoises a challenge! Villagers and volunteers built fences and housing for the tortoises. Rocks were hauled and chunks of limestone were dug up and mixed into concrete. No electricity meant no power tools, so boards used for buildings were hand cut from logs with an axe.



## Author's Note:

In October 2018, another 7,000 radiated tortoises were confiscated from a wildlife trafficker, and now they are housed at the Itampolo facility. There is currently a 3-year action plan in place spearheaded by zoos to develop a reintroduction strategy by 2021.

## ILLEGAL TRADE IN OUR OWN BACKYARD

Wildlife trafficking is closer than you think—it may even be in your own backyard. In 2017, a tiny Bengal tiger cub was confiscated near San Diego when a man attempted to cross the United States-Mexico border with it on the floor of his car. With the help of U.S. Customs and Border Patrol, the little big cat found refuge at the Safari Park, where expert animal care staff ensured that he had the food, nutrition, and care needed to thrive. But Moka, as he was named, also had to learn to become a tiger. Shortly after his arrival, he was joined by Rakan, a young Sumatran tiger from Smithsonian's National Zoo in Washington, D.C. Rakan's mother was unable to care for him, but together, these two young cubs had a fighting chance at a healthy start. Moka's story shows that wildlife trafficking is happening all around us.





# PLANNING WHERE ELEPHANTS CAN THRIVE

By **Megan Owen**, Ph.D., Director, Population Sustainability, and **Shifra Goldenberg**, Research Fellow, Population Sustainability, and International Programs Manager, Smithsonian Conservation Biology Institute



Elephants in Africa and Asia are under tremendous threat from poaching wherever they roam. Since overexploitation is one of the primary threats facing biodiversity globally, the illegal wildlife trade persists as a leading motivation for hunting. As species have long been valued economically, elephants face particular challenges regarding wildlife trafficking. Hunting for ivory that can be carved into art products has driven periodic declines in African elephant populations for centuries.

The most recent wave of ivory poaching over the last decade reached unsustainable levels that could not be offset by natural birth rates. This is particularly devastating for African forest elephants: they reproduce even more slowly than African savanna elephants. Although Asian

elephants have been under less pressure for ivory poaching because of their smaller tusks, today their skin is highly valued on international markets. Poaching for Asian elephant skin is on the rise, and the equal value placed on calves, cows, and bulls for their skin is particularly troubling when considering population sustainability. Overall, the illegal wildlife trade remains a very real threat for elephant conservation globally.

Because wildlife trafficking is a complex issue tied to enormous economic gains, reducing an illegal trade that contributes to biodiversity crises requires a multipronged approach. One critical component for addressing unsustainable wildlife trafficking is ensuring that strong conservation programs exist in these countries. For

elephants, this means supporting opportunities for populations to thrive where they will be protected.

In Kenya, we are developing protocols to monitor released orphaned calves that have been rehabilitated at a community-run sanctuary after injuries or separation from their herd. In Myanmar, we are conducting research to understand if elephants that have worked with people for decades have the ability to thrive in the wild on their own and avoid future human-wildlife conflicts. We hope this research and planning will lead to successful re-wilding efforts.

Our projects work to curb the illegal wildlife trade in two powerful ways. First, by supporting strong elephant populations that coexist among human populations, we

work to guard against declines that can occur rapidly and under the radar with wildlife trafficking networks operating in less accessible populations. Next, by developing programs in partnership with local communities, our work affects attitudes regarding wildlife value, which accomplishes the long-term goal of coexistence without the need for poaching.

Supporting wild populations and fostering positive attitudes toward elephants are foundational parts of curbing illegal wildlife trade. While demand for elephant parts occurs in waves as it has for centuries, creating community support in regions where elephants can still thrive ensures that poaching will have a harder time taking hold. It may be our only solution to protecting all elephants from extinction. ●



As a part of our research programs, we engage in careful planning for African and Asian elephant translocation efforts in Kenya and Myanmar, which retain prime elephant habitats and are excellent places in which to help populations thrive.

## —DID YOU KNOW?—

There is a new and alarming trend: Asian elephants, both calves and adults, are now killed for their skin as well as for their tusks. It is valuable on international markets, and poaching is on the rise.

## The most trafficked animal in the world?

The nature of the trade makes it hard to say for sure, but pangolins, unusual and unique mammals, are likely the most trafficked animal in the world. Their scales are believed to be powerful and are used in traditional medicine, but they're just made of keratin—the same as your hair and fingernails.



*“Supporting wild populations and fostering positive attitudes toward elephants are foundational parts of curbing illegal wildlife trade.”*

—MEGAN OWEN



# CONSERVATION ACHIEVEMENTS

## HONORS AND AWARDS

The **Center for Plant Conservation** was awarded an IMLS National Leadership Grant for \$491,630 to support the creation of a real-time learning platform, where experts can share best practices with practitioners.

Our **Wildwatch Kenya** online citizen science program was featured at the Illegal Wildlife Trade conference held in London with an audience of over 800, including Prince William.

Our **'Alalā Reintroduction Community Inquiry Program** received a UL Innovative Education Award at the Annual Conference of the North American Association for Environmental Education.

Postdoctoral fellow **Dr. Timothy Eppley** was awarded the American Society of Primatologists Dr. Deb Moore Memorial Award for Early Career Primatologists.

## HIGHLIGHTED PUBLICATIONS

The fight to end extinction happens on a variety of fronts. Our San Diego Zoo Global conservation scientists and researchers work to lead this fight in every capacity, whether studying the smallest cells or working with the biggest animals. From studying how to help Cameroon's gorillas through community awareness, to working on recovering the northern white rhino species through genetic rescue efforts, to evaluating how to halt the decline in giraffe populations, here's what we've published lately:



**Mfossa, D., E. Abwe, and B. Morgan.** 2017. Conserving the Ebo gorillas through community collaboration. *Gorilla Journal* 55: 16-20.

This article summarizes outreach work we have been conducting to increase conservation awareness and action around gorilla habitat in Cameroon's Ebo Forest, including partnering with primary schools in basic conservation awareness; organizing an annual "Gorilla Cup" soccer tournament; weekly radio broadcasts; and supporting small-scale and sustainable livelihood strategies in villages.



**Tunstall, T.,** R. Kock, J. Vahala, M. Diekhans, I. Fiddes, J. Armstrong, B. Paten, **O. A. Ryder,** and **C.C. Steiner.** 2018. Evaluating recovery potential of the northern white rhinoceros from cryopreserved somatic cells. *Genome Research* 28: 780-788.

We estimated the recovery potential of the northern white rhino from cryopreserved cells banked in our Frozen Zoo® by analyzing genome-wide levels of genetic diversity, inbreeding, population history, and demography. Our findings demonstrate the value of cryopreserved genetic material as a potential gene pool for saving this subspecies via genetic rescue.



Muneza, A., J. B. Doherty, A. Hussein Ali, J. Fennessy, A. Marais, **D. O'Connor,** and T. Wube. 2018. *Giraffa camelopardalis* ssp. *reticulata*. The IUCN Red List of Threatened Species 2018.

We contributed to an updated IUCN Red List assessment for the reticulated giraffe. On the basis of an estimated continuing population decline of more than 50 percent over the last 30 years, the reticulated giraffe has been upgraded to Endangered status. The decline is most likely attributed to habitat loss, deterioration in habitat quality, and illegal killing/poaching.

# UNITED STATES & BEYOND PARTNERSHIPS

We currently face one of the world's most urgent conservation challenges: the illegal wildlife trade. San Diego Zoo Global recognizes the devastating—and unsustainable—impacts wildlife trafficking has on plant and animal species worldwide and their ecosystems. Countless species are at risk. We actively participate

in outreach programs to reduce demand for wildlife products, partner with organizations that combat the illegal wildlife trade, and offer our expertise to government agencies in their law enforcement efforts. Below are just a few of our partners who have joined us in protecting vulnerable plants, animals, and their habitats:

## AFRICA

- Giraffe Conservation Foundation
- Lewa Wildlife Conservancy
- Loisaba Conservancy
- Northern Rangelands Trust

## ASIA PROJECT

- Animals Asia
- Free the Bears
- TRAFFIC Vietnam
- University of Bristol
- University of Oxford
- Wildlife SOS

- Royal University of Phnom Penh
- Saiga Conservation Alliance
- Smithsonian Conservation Biology Institute

## OTHERS

- ACEAA (Conservación Amazónica, Bolivia)
- AZA (Association of Zoos and Aquariums)
- California Department of Fish and Wildlife
- Oxford Martin School, University of Oxford
- TRAFFIC SEA
- U.S. Department of State
- U.S. Fish and Wildlife Service





# WHAT'S News



## RECOVERY ECOLOGY

A new milestone: 259 froglets were restored to the San Bernardino Mountains in the largest reintroduction of endangered mountain yellow-legged frogs in the program's history.



## PLANT CONSERVATION

Long-term efforts to restore prickly pear cactus have paid off with the return of nesting coastal cactus wrens—a species of special conservation concern.



## POPULATION SUSTAINABILITY

Working with the Samburu community, we developed a behavioral monitoring program to track the success and well-being of released elephant orphans in Kenya.



## CONSERVATION GENETICS

We sexed 76 San Clemente loggerhead shrikes using DNA extracted from feather samples to assist with breeding efforts for this endangered bird.



## REPRODUCTIVE SCIENCES

For the first time, our team thawed semen from the rock wrasse, establishing a model for future preservation of gametes from endangered fish.



## DISEASE INVESTIGATIONS

We are investigating immune response in polar bears to better predict how spending more time on land impacts their ability to cope with terrestrial-based diseases.



## COMMUNITY ENGAGEMENT

Our Advanced Inquiry Master's program has a new course offering that covers socioecological systems theory and adaptive management for conservation planning.



## BIODIVERSITY BANKING

This new team will curate and manage thousands of biological resources in the Frozen Zoo®, Native Plant Seed Bank, and Pathology Archive, with opportunities to share samples worldwide.

# SavingSpecies™

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