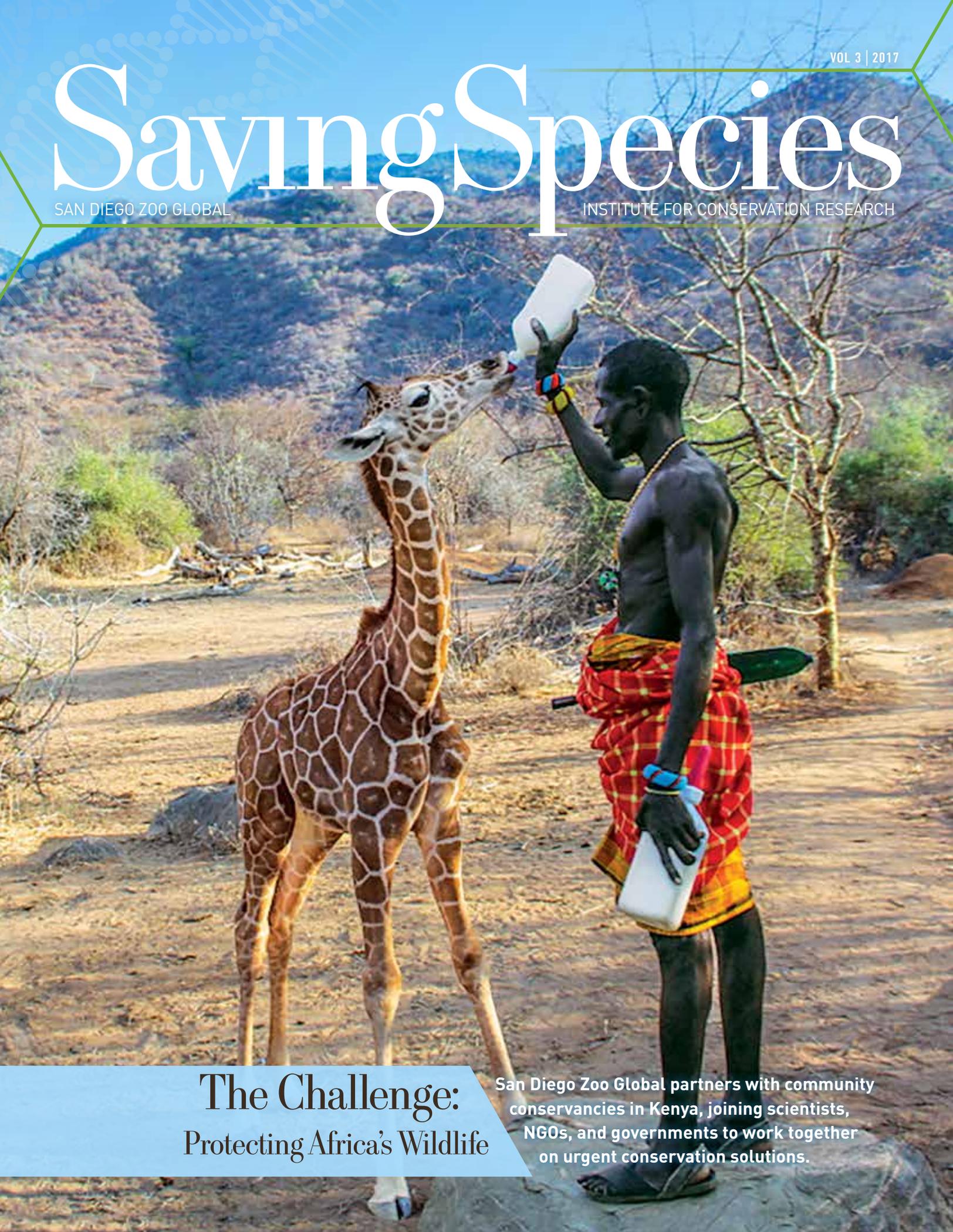


Saving Species

SAN DIEGO ZOO GLOBAL

INSTITUTE FOR CONSERVATION RESEARCH



The Challenge:
Protecting Africa's Wildlife

San Diego Zoo Global partners with community conservancies in Kenya, joining scientists, NGOs, and governments to work together on urgent conservation solutions.

To be successful, conservation efforts must inspire, inform, and empower people living alongside wildlife to sustainably coexist with animals.

—David O'Connor



Reticulated giraffes, one of the most endangered large animal species, are rapidly disappearing. Their numbers have declined nearly 80 percent in just 20 years, although they seem to have found refuge at last in Northern Rangelands Trust's community conservancies. This led San Diego Zoo Global to launch the Twiga Walinzi, or Giraffe Guards, a conservation and research program that engages local people to monitor and protect giraffes, including snare removal and ranger patrols, as well as a firm focus on community outreach. This year, we attached satellite tracking units to 11 giraffes, so we can understand where they roam and which habitats need protection.

Where Actions Speak Louder than Words

Hope. It is a word not often heard when talking about conservation. Yet as San Diego Zoo Global teams partner on projects with the community conservancies of northern Kenya, they are proving that conservation can work for wildlife and people—it is the best way forward.

In these pastoralist communities, neighbors are quietly coming together to find solutions to wildlife crises. Some are stepping up to become antipoaching rangers while others volunteer to monitor where wildlife roam. There are even teams that care for orphaned or abandoned giraffe, elephant, and black rhino calves before releasing them back into the wild or helping them rejoin their herds whenever possible. Together, these unsung heroes are making a tremendous difference for vulnerable wildlife.

How You Can Help

San Diego Zoo Global research teams all over the world rely on the generosity of donors like you to help achieve our vision to lead the fight against extinction. To learn ways you can help, please call Maggie Aleksic at 760-747-8702, option 2, ext. 5762, or email maleksic@sandiegozoo.org.

ON THE COVER: In the Namunyak Conservancy, Samburu tribesman Lekupanii is so dedicated to caring for giraffe orphans like Mara that he spends his entire days with them, greeting them with a big smile and milk bottles. *Photo by David O'Connor.*



Trail cameras help our team monitor where giraffes roam. Here David discusses photos with Lexson Larpei, one of the Twiga Walinzi.

A Bold New Vision

By David O'Connor, Researcher, Global Partnerships

Conservation: it's all about wildlife, right? Actually, conservation is really about wildlife and people. To be successful, conservation efforts must inspire, inform, and empower people living alongside wildlife to sustainably coexist with animals. Ultimately, it is the local people who live with the wildlife we care about who also determine their future.

This is especially true in northern Kenya, where the majority of open land is managed by local people who are pastoralists herding livestock like cattle, sheep, goats, and camels. They settle in an area with their livestock for a month or two, then move to a new location in search of fresh grazing land. The key is that there are no fences or farms, so people, livestock, and wildlife share the land, overlapping and using the same resources such as water holes. This is a true example of sustainable coexistence between people and wildlife that has evolved over millennia.

These communities are vital to conservation in the region—without them, all hope for wildlife is lost. We recognize this, which is why San Diego Zoo Global (SDZG) partners closely with community conservancies across northern Kenya. Over the past 14 years, SDZG has helped support the Northern Rangelands Trust (NRT), an umbrella organization that creates and manages a network of 35 pastoralist community conservancies, maintaining a balance between wildlife conservation and livestock herds. Remarkably, these conservancies encompass an area four times as large as San Diego County and larger than all of Kenya's national parks and reserves combined.

Continued on page 3



Ewaso Lions: Connecting People with Wildlife

The Samburu community firmly believes that lion conservation succeeds if local people who live alongside large carnivores are involved. Ewaso Lions tailors its programs for different groups: Samburu women (Mama Simbas), children (Lion Kids Camp), elders (Wazee Watch), and warriors (Warrior Watch). Each group takes a different leadership role in the community, such as training others to collect wildlife data, acting as wildlife educators and ambassadors on predator issues, developing alternative livelihoods, or offering opportunities to tourists as well as local children so they can experience Kenya's incredible wildlife firsthand. This community-based initiative helps people and wildlife thrive.



Women are key to NRT's mission of developing resilient community conservancies. Now women's bead craft businesses are contributing to their family's income and supporting local conservation efforts.



Continued from page 2

Community conservancies underpin SDZG's species-specific conservation projects. Our full-spectrum conservation initiatives focus on species that range from "Vulnerable" to "Critically Endangered" on the IUCN Red List. These programs include the *Twiga Walinzi*, or Giraffe Guards program, which has hired 11 local people who now work on reticulated giraffe conservation. Others include the hirola antelope conservation postdoctoral program; Reteti Elephant Sanctuary and Orphanage; Sera Wildlife Conservancy black rhino reintroductions; leopard conservation and conflict reduction; coexistence for elephants and people; lion conservation with Ewaso Lions; the Grevy's Zebra Trust and others.

Some on our team work on solving questions about the animals we are

protecting: where do giraffes roam, how many leopards live within a conservancy, or how to prevent disease transmission in endangered hirola antelope. Our social scientists, Kirstie Ruppert and Dr. Jenny Glikman, also gather information on how people interact with wildlife, the needs and priorities of those who share the land in these conservancies, and the best ways to support coexistence: we call this "human dimension" information. It informs the design of our conservation work, helping us create conservation messages that resonate with local values and culture. These can be combined with ecological data to determine which areas have vulnerable wildlife and need ranger patrols.

Overall, the community conservancy approach not only benefits wildlife

but also the entire community. This includes improved pasture management for both wild and domestic animals along with ecotourism benefits. It creates new opportunities for families to earn additional income as wildlife populations return to the region and local people find new employment. Conservancies also provide better security with antipoaching patrols as well as build health clinics and schools. All these benefits flow from conservation programs, helping these communities take ownership and protect the wildlife on their lands.

Projects like this build trust between conservation organizations and community members, helping us achieve our shared goal—protecting Kenya's irreplaceable wildlife and natural resources.



NRT and GREVY'S ZEBRA TRUST: UNITED FOR A COMMON GOAL

In 2004, San Diego Zoo Global made a commitment to support the newly formed NRT and the West Gate Community, a local conservancy living within Grevy's zebra habitat. This partnership helped achieve security for its people and wildlife. Our curators and collections staff helped develop this relationship and supported it as it grew. Then in 2007, the Grevy's Zebra Trust (GZT) was founded from within NRT and chose West Gate as its headquarters. When GZT and the community evaluated degraded habitat that could no longer support wildlife, because of continuous livestock grazing, they made an inspired decision. A balanced management strategy for rangelands would benefit the community and wildlife, allowing them to conserve Grevy's zebras—their flagship species—by sharing habitat with livestock. We're proud to say this model program has grown from one community conservancy on 300 acres to many communities: over 4 million acres are now under improved grazing management.



COMMUNITIES



NAMUNYAK



LOISABA



SERA



ISHAQBINI



WEST GATE



LEWA

WORK

- SUSTAINABLE JOBS
- STUDENT EDUCATION
- WOMEN'S INITIATIVES
- ECOTOURISM

- CONSERVATION RESEARCH
- DISEASE MONITORING
- STAFF TRAINING

- ANIMAL CARE
- WILDLIFE CONSERVATION
- RANGER PATROLS

- SUSTAINABLE LIVESTOCK
- WILDLIFE MANAGEMENT
- COMMUNITY COLLABORATIONS

BENEFITS

ANIMALS

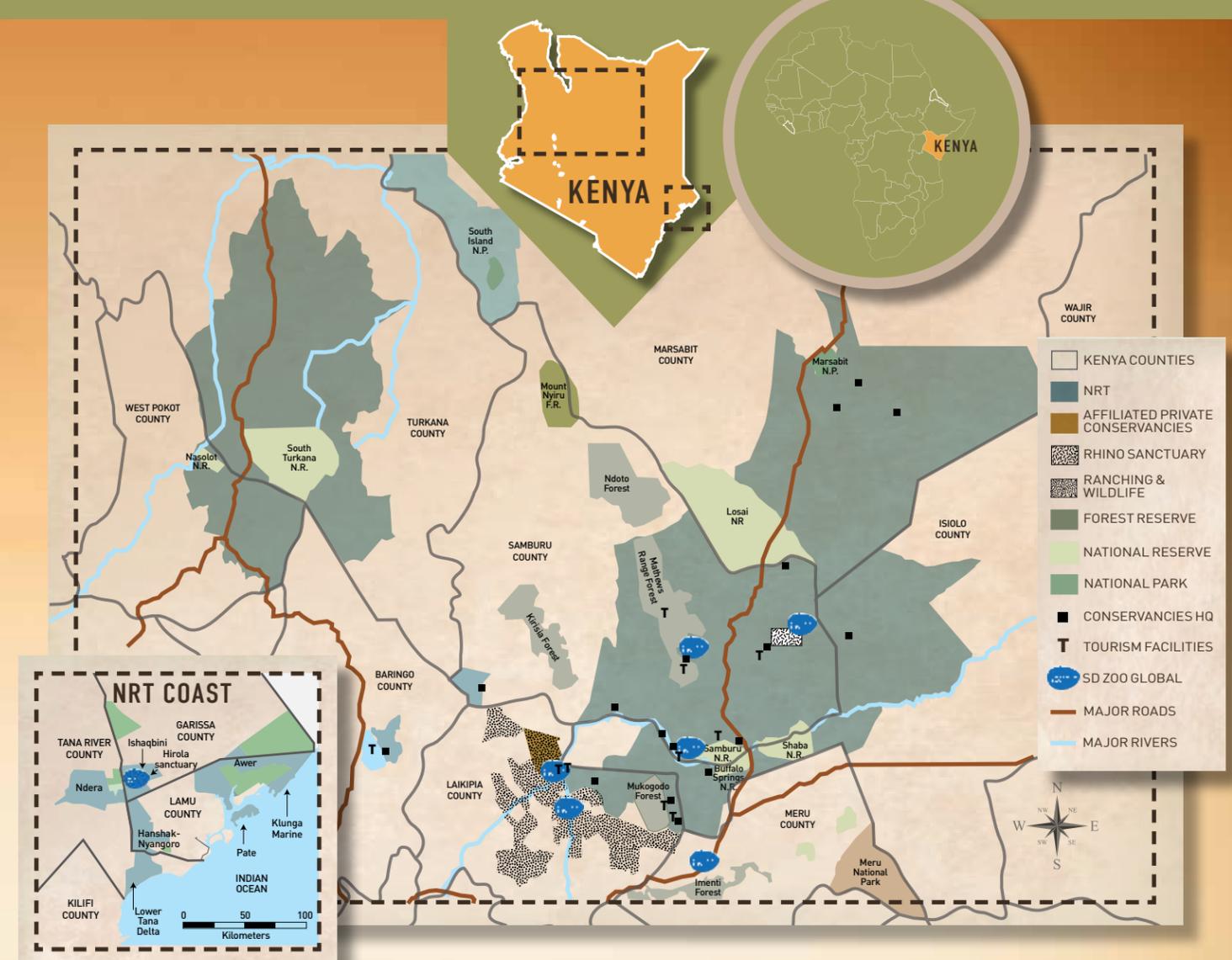


COEXISTENCE

ANIMAL CARE
CONSERVATION

PEOPLE

- SECURITY
- HEALTH CARE
- CLEAN WATER
- EDUCATION
- EMPOWERING WOMEN
- PASTORALISM/RANGE MANAGEMENT
- WILDLIFE TOURISM
- ECONOMIC SUSTAINABILITY



SAN DIEGO ZOO GLOBAL PARTNERS WITH THE NORTHERN RANGELANDS TRUST: A MODEL FOR COMMUNITY CONSERVANCIES

MISSION: To develop resilient community conservancies, which transform people's lives, secure peace, and conserve natural resources.

A community-led, nongovernmental organization, NRT was established in 2004 in northern Kenya by a coalition of local leaders, politicians, and conservation interests. Its 35 community conservancies work across 4.5 million hectares (11.1 million acres) in northern and coastal Kenya—far greater than all of Kenya's national parks combined. With support from donors, NRT empowers communities to develop local governing plans, take the lead in natural resource management, and oversee sustainable businesses linked to conservation. Its remarkable success and growth is linked to its significant impact on building peace and security in the region, managing rangelands, protecting wildlife, and improving lives.

RETETI ELEPHANT SANCTUARY:

Community-inspired Animal Care

By Nadine Lamberski, Corporate Director of Animal Health, Veterinary Services, DVM, Dipl. ACZM, Dipl. ECZM (ZHM)

When the call comes in regarding an injured or abandoned elephant calf in remote areas of northern Kenya, the mobile rescue elephant team from the Reteti Elephant Sanctuary goes into action. The 24 caretakers, all from the Namunyak Wildlife Conservancy, are ready to help.

Providing nursing care to traumatized and injured elephants poses unique challenges. If trapped in a well, the first step is to remove the calf from harm's way and quickly assess its health. If the mother is nearby, a reunion is attempted. If the herd has moved off, transporting the calf by helicopter to the sanctuary may be the fastest way to provide the additional care it needs. Next, caretakers spend day and night with the calf, encouraging it to eat and helping to establish bonds with other calves in the herd. At Reteti, they are perfecting the skill of returning lost calves to their family herds.

Elephant poaching across Africa continues at unsustainable rates, yet in the remote Mathews Range—home to Kenya's second-largest elephant population—community-driven conservation efforts are having a significant impact. The number of illegally killed elephants in these community conservancies has decreased by 53 percent over the past five years. Despite this positive trend, elephant calves are still orphaned or abandoned because of poaching, drought, human-wildlife conflict, and from falls into man-made wells, as well as deaths from natural causes.

Reteti Elephant Sanctuary, the first community-owned elephant orphanage in Africa, was opened in August 2016 by the Namunyak Wildlife Conservancy in Samburu County. The people who share the land with the elephants also provide the extended care needed until calves are weaned. Youngsters are released back to native herds when they reach two to three years of age. If only separated from their herd, healthy calves receive care for a few days or weeks. When the herd returns to the area, mother and calf are reunited—the best possible solution!

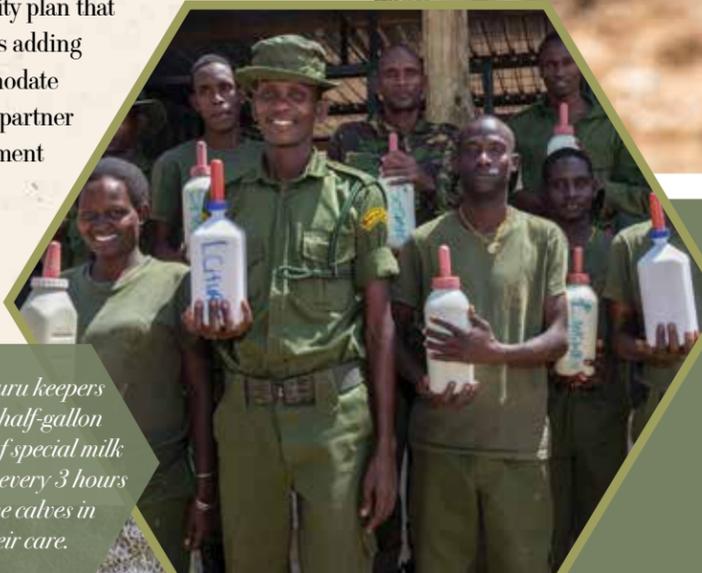
The Kenya Wildlife Service (KWS) conserves and manages Kenya's wildlife, and San Diego Zoo Global (SDZG) veterinarians, nutritionists, animal care staff, and scientists collaborate with KWS. Working with KWS veterinarians provides a unique opportunity for SDZG staff to learn from our partners, share our knowledge, and advance the science of animal care together.

San Diego Zoo Global has helped by setting up a small clinical laboratory at the sanctuary. We are also training staff to perform diagnostic tests to better monitor the calves' health. Our nutritionists are reviewing feeding formulas and making recommendations to streamline practices and conserve resources. Our veterinarians are working with KWS to review treatment protocols and improve biosecurity to prevent the spread of infectious diseases. It's very inspiring to use the skills carefully honed in San Diego Zoo's fast-paced hospital environment and transfer this knowledge to a remote field location to save elephant calves.

Future plans for Reteti and San Diego Zoo Global collaboration include continued financial support for training local staff and developing a strategic facility plan that allows for smart growth, such as adding stalls and paddocks to accommodate growing elephant calves. As we partner to implement the best management practices, we will also promote safety for staff and elephant-to-elephant bonding. Although Reteti began small, already it has made a big impact.



Samburu keepers bring half-gallon bottles of special milk formula every 3 hours for the calves in their care.



It's very inspiring to use the skills carefully honed in San Diego Zoo's fast-paced hospital environment and transfer this knowledge to a remote field location to save elephant calves. —Nadine Lamberski



Determined to Save the Hirola

By Megan Jones, DVM, Ph.D., Dipl. ACVP, Senior Scientist, Disease Investigations

In remote, northeastern Kenya lives one of Africa's most endangered antelope species, yet most people have never heard of it. The shy hirola has elegant, lyre-shaped horns, a tawny coat, and striking white spectacles around the eyes. Today, there are fewer than 500 left. Most still live within their historic range in Kenya, alongside zebras, giraffes, topi, lesser kudu, gerenuks, and even elephants, which are beginning to repopulate the area. Hirola also live among the domestic goats, sheep, and cattle of the local Somali pastoralist communities, who are now guardians of the hirola in their midst.

On my trip earlier this year, I met with conservancy rangers to provide training about wildlife diseases. We want to make sure we can detect any illness as soon as possible—we know disease was a major problem for hirola in the past. Forty years ago, more than 15,000 hirola lived in Kenya and southern Somalia. Then the population dropped precipitously in the 1980s because of a combination of disease, drought, predation, and poaching. In particular, it's thought many hirola died during an outbreak of rinderpest, a now-eradicated viral disease that affects cattle.

Fortunately for the hirola, the local Somali community became concerned and formed the Ishaqbini Hirola Community Conservancy. In 2012, with support from the Northern Rangelands Trust (NRT), Kenya Wildlife Service, and other groups, 48 hirola were moved into a predator-free, fenced sanctuary. Conservancy rangers who live in the area patrol the sanctuary, monitor the population, and keep hirola safe. They are also extremely knowledgeable about domestic animals like cattle, sheep, and goats, and an experienced livestock veterinarian from NRT oversees a vaccination and parasite control program.

Now the number of hirola within the fenced sanctuary has more than doubled to 100. But threats still exist: two problems from the past, drought and disease, are ongoing concerns. The Disease Investigations team from the San Diego Zoo Institute for Conservation Research and our postdoctoral fellow based in Kenya will be working closely with the NRT to understand and monitor for health threats to hirola in the field.

The health of livestock in the area is also extremely important. Livestock are the livelihood of local people who are the stewards of the sanctuary. Since the herds and flocks live alongside hirola, we're concerned about disease transmission between livestock and wildlife, in either direction. Livestock vaccination, parasite control, and basic veterinary care are critical for keeping people, domestic animals, and wildlife healthy in the future.



Fortunately for the hirola, the local Somali community became concerned and formed the Ishaqbini Hirola Community Conservancy.

—Megan Jones



Dr. Jones meets with Ishaqbini elders to discuss keeping hirola disease free and safe.

Photo courtesy of Andrea King

SUPPORTING EDUCATION THAT SUPPORTS CONSERVATION

By Kirstie Ruppert, Research Coordinator, Community Engagement



San Diego Zoo Global helped fund scholarships, desks and chairs, along with educational materials for local schools.

Kenya's community conservancies are working diligently to return benefits from wildlife conservation back to pastoralist communities. The pastoralist lifestyle is dependent on living close to nature, so the people we work with have extensive knowledge and respect for the land and wildlife. Caring for livestock provides practical knowledge herders need, yet many parents also want their children to have lessons in formal classrooms.



Perhaps most importantly, Twiga Walinzi will be sharing how they have dedicated their careers to conservation, so that they may be seen as wildlife heroes and role models for Kenya's next generation of young conservationists.

- Kirstie Ruppert

This year, with our financial support for school improvement, the *Twiga Walinzi* (Giraffe Guards) donated books, supplies, desks, and chairs to Morijo Primary School near Loisaba Conservancy, helping 120 students attend class in a space conducive to learning. These furnished classrooms will now become a community hub, also providing a meeting place for our researchers to share their work and conservation messages with students' parents. At Namunyak Wildlife Conservancy, San Diego Zoo Global's contributions to the community fund provide scholarships for students to help ensure that young learners can join vibrant classrooms.

Our education efforts are rooted in collaborations with educators from 12 conservation organizations. This collective has partnered with the Community Engagement and Global Partnerships teams at the San Diego Zoo Institute for Conservation Research, as well as the San Diego Zoo's Education Department, to offer several teacher workshops over the past two years. These training sessions in conservation education equip local educators like those in Kenya to unite communities around a shared vision of coexistence between people and wildlife.

Next, our Kenyan research teams will spearhead Wildlife Clubs to build pride for biodiversity in their area. The *Twiga Walinzi* will visit more classrooms, offering wildlife lessons, stories, and photos of their work in the field, including impressive trail camera images of wildlife like giraffes, zebras, and lions. Perhaps most importantly, *Twiga Walinzi* will be sharing how they have dedicated their careers to conservation, so that they may be seen as wildlife heroes and role models for Kenya's next generation of young conservationists.

Just as we believe conservation education is key to saving plant and animal species in our region, San Diego Zoo Global is committed to connecting learners of all ages with Kenya's incredible wildlife. All these efforts strengthen the connection between local conservation projects and opportunities for education, offering hope for a sustainable future that supports both wildlife and people in Kenya's rangelands.



HONORS AND AWARDS

At the 40th annual International Herpetological Symposium, **Jeff Lemm**, conservation program specialist in the Population Sustainability division, received the Louis Porras Conservation Award. This award is presented to a speaker who has demonstrated that his or her work represents exceptional accomplishments in the field that benefit herpetological conservation.

Our **Disease Investigations** team received a plaque from the Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center at Twentynine Palms, California, thanking us for our support with their desert tortoise translocation program.

The **Central Africa Program** has been awarded a three-year grant from the Arcus Foundation to continue our conservation work in and around the Ebo Forest in Cameroon. The \$250,000 award will be used to reinforce and expand our community outreach project, initiate a new monitoring program, and launch a new media outreach effort.

PUBLICATION HIGHLIGHTS

Our San Diego Zoo Global conservationists, scientists, and researchers are constantly working to help us lead the fight against extinction. From gathering molecular data on addax to the role of humans and their cultures in wildlife management, to discovering how to advance reproduction in southern white rhinos, as well as studying genetic relationships of island iguanas, there is so much work to be done. Here's what we've published lately (SDZG staff names are bolded below):

In a recent study, we evaluated two molecular methods to resolve unknown relationships within a zoo-based population of addax. Both methods accurately estimated relatedness between animals, despite this being an extremely bottlenecked population. This study served as both proof of concept and a model for applying molecular data to the genetic management of conservation breeding programs.

Ivy, J. A., A. S. Putnam, A. Y. Navarro, J. Gurr, and O. A. Ryder. 2016. Applying SNP-derived molecular ancestry estimates to captive breeding programs. *Journal of Heredity* 107: 403-412.

The relatively new field of human dimensions takes into account things like community attitudes, cultural beliefs, and people's livelihood needs when developing conservation plans and solutions. This literature review analyzed how often those elements are considered, what topics they address, their geographic distribution, and how they are prioritized in different regions of the world.

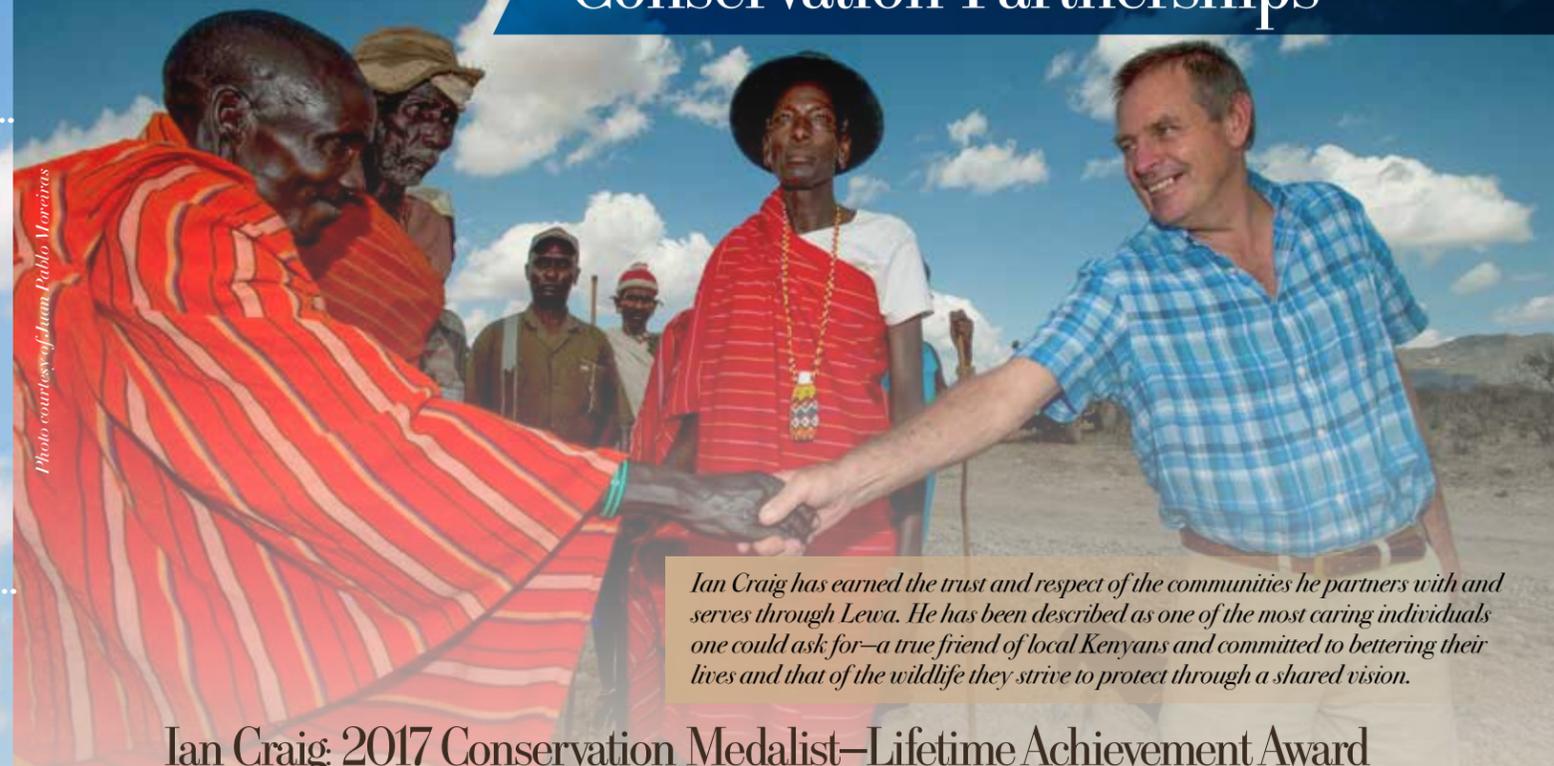
Lavadinović, M. V., **J. A. Glikman**, and U. Schrami. 2017. Current role, importance and characteristics of human dimensions in wildlife management, a preliminary assessment from European and North American scientific journals. *Balkan Journal of Wildlife Research* 4: 21-28.

In a recent study, we investigated the role of phytoestrogens produced by plants in the reproductive failure of zoo-born female southern white rhinos. Examination of data from nine zoos suggested that fetal exposure to phytoestrogens through the maternal diet can hinder the ability of female offspring to reproduce later in life.

Tubbs, C. W., L. A. Moley, J. A. Ivy, L. C. Metrione, S. LaClaire, R. G. Felton, B. S. Durrant, and M. R. Milnes. 2016. Estrogenicity of captive southern white rhinoceros diets and their association with fertility. *General and Comparative Endocrinology* 238: 32-38.

To assess the genetic relationships of various Turks and Caicos iguanas, we examined samples of 280 individuals from 30 island populations. We identified a western and eastern lineage, representing two independent, evolutionarily significant units that should be preserved as part of future conservation management planning for the species.

Welch, M. E., E. G. Colosimo, **S. A. Pasachnik**, C. L. Malone, J. Hilton, J. Long, A. G. Getz, **A. C. Alberts**, and **G. P. Gerber.** 2017. Molecular variation and population structure in critically endangered Turks and Caicos rock iguanas: identifying intraspecific conservation units and revising subspecific taxonomy. *Conservation Genetics* 18: 479-493.



Ian Craig has earned the trust and respect of the communities he partners with and serves through Lewa. He has been described as one of the most caring individuals one could ask for—a true friend of local Kenyans and committed to bettering their lives and that of the wildlife they strive to protect through a shared vision.

Ian Craig: 2017 Conservation Medalist—Lifetime Achievement Award

Since the 1980s, probably no single person in Kenya has had more influence in advancing the cause of wildlife conservation than Ian Craig. Growing up shoulder to shoulder with tribal Kenyans, Ian understands their culture, the needs of the community, and how to help local people and wildlife coexist in ways that benefit both. It all began with the Lewa Wildlife Conservancy on the Craig ranch, which led to the Northern Rangelands Trust, making the Craig name a byword for conservation in the region.

Most of Ian's life has been spent in northern Kenya, where he and his father, David Craig, along with conservationist Anna Merz,

converted thousands of acres of their family's 62,000-acre cattle ranch into Ngare Sergoi Rhino Sanctuary in 1983 to protect endangered black rhinos. This was the height of the rhino and elephant poaching crisis and the sanctuary flourished when few others did.

The sanctuary soon doubled in size, and in 1995 it was renamed the Lewa Wildlife Conservancy, with Ian serving as Executive Director until 2009. Lewa has continued to actively promote conservation on its land and with communities that set aside land for wildlife conservation. In 2004, Ian headed the effort to form the Northern Rangelands Trust, which today supports 35 community wildlife

conservancies in northern Kenya.

It is virtually impossible to place a value on what Ian Craig has done to protect countless wildlife species. It is his life's work and will never end because now so many others have come together to protect their native habitat and its animals as more wildlife conservancies are formed and more communities are engaged.



In 2017, Ian Craig received the San Diego Zoo Global Conservation Medal for Lifetime Achievement.

SAN DIEGO ZOO GLOBAL'S KENYAN CONSERVATION PARTNERS

An integrated approach to conservation in Kenya involves more than 10 San Diego Zoo Global departments and many international and in-country partners. Now we have an interdisciplinary program that harnesses our century of knowledge and expertise in conservation, animal care, and veterinary practice with these dedicated partners:

Ewaso Lions
Giraffe Centre—African Fund for Endangered Wildlife
Giraffe Conservation Foundation
Goethe University
Grevy's Zebra Trust
Ishaqbini Hirola Community Conservancy
Kenya Wildlife Service
Lewa Wildlife Conservancy

Loisaba Conservancy
Mpala Research Centre & Wildlife Foundation
Namunyak Wildlife Conservation Trust
The Nature Conservancy—Africa
Northern Rangelands Trust
The Peregrine Fund
RESCUE: Reteti Elephant Sanctuary—Community United for Elephants

Sarara Camp
Save the Elephants
Senckenberg BiK-F
Sera Wildlife Conservancy
Smithsonian National Zoo and Conservation Biology Institute
West Gate Community Conservancy

RECOVERY ECOLOGY

As part of a five-year project in the San Jacinto River basin, we translocated 60 endangered San Bernardino kangaroo rats and 144 Los Angeles pocket mice, a California species of special concern, back to the wild.



PLANT CONSERVATION

We preserved multiple Torrey pine tissue types that will be used to optimize genomic protocols for conservation research at the Torrey Pines State Natural Reserve and will serve as a repository for future sequencing of the Torrey pine transcriptome.



REPRODUCTIVE SCIENCES

Working together with veterinary and curatorial staff, we achieved the first artificial insemination of a southern white rhino at San Diego Zoo Global, an important first step in saving the northern white rhino.



GLOBAL PARTNERSHIPS

Attended the 5th annual European Roundtable meeting for the Roundtable on Sustainable Palm Oil (RSPO), participating in the PONGO Alliance, an industry and NGO thought group that examines progress on palm oil sustainability efforts.



WHAT'S NEWS



CONSERVATION GENETICS

We have succeeded in growing induced pluripotent stem cells from male rhino Angalifu, allowing us to examine gene expression and differentiation into different cell types and bringing us one step closer to saving the northern white rhino.



Photo courtesy of Christos Astorgas

POPULATION SUSTAINABILITY

Our team is collaborating on the development of a conservation action plan for Preuss's red colobus monkey in the Ebo Forest of Cameroon, one of only two remaining locations for this elusive, critically endangered species.



DISEASE INVESTIGATIONS

Our team recently assisted in establishing a developmental display of California condors at the Smithsonian National Museum of Natural History, where the series will be made available for scientists around the world to study.



COMMUNITY ENGAGEMENT

We are exploring sustainable, alternative livelihoods for the Upper Gulf of California, including expanding nature-based tourism activities, marketing artisanal crafts, and implementing aquaculture and mariculture.

SavingSpecies

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