Wild Nature Institute

2021 Annual Report

From the Founders

In 2021, the Wild Nature Institute celebrated **10 years of science, education, and advocacy** for wildlife in savannas of East Africa and forests of the western U.S.A. Both regions are biologically rich but threatened by human activities.

We continued the **world's largest demographic study of giraffes**. Using non-invasive photographic identification, we are now studying Masai giraffe populations in six Protected Areas across northern Tanzania. Together with our research partners at institutions around the world, we published 5 scientific papers about population ecology, behavior, and health of giraffes in 2021.

Our **Celebrating Africa's Giants education program** also thrived in 2021. In addition to learning about savanna wildlife, ecology, and conservation in their classrooms, Tanzanian schoolchildren celebrated World Giraffe Week, held a Giraffe Fun Day, planted native trees, and visited their backyard national parks for the first time.

We published an important paper showing that post-fire logging and not wildfire is a threat to **Spotted Owl** populations.

We (virtually) shared our knowledge about giraffes and Spotted Owls at conferences, schools, webinars, and media outlets throughout the year.

We could not have accomplished our goals without the support of our donors and partners. We are deeply grateful.

Dr. Derek E. Lee and Dr. Monica L. Bond
Founders and Principal Scientists

Meet The Wild Nature Institute!

WHO WE ARE (from left to right):

Dr. Monica Bond, Principal Scientist

Veila Makundi, Anne Innis Dagg Education Coordinator

James Madeli, Giraffe Research Coordinator

Dr. Derek Lee, Principal Scientist

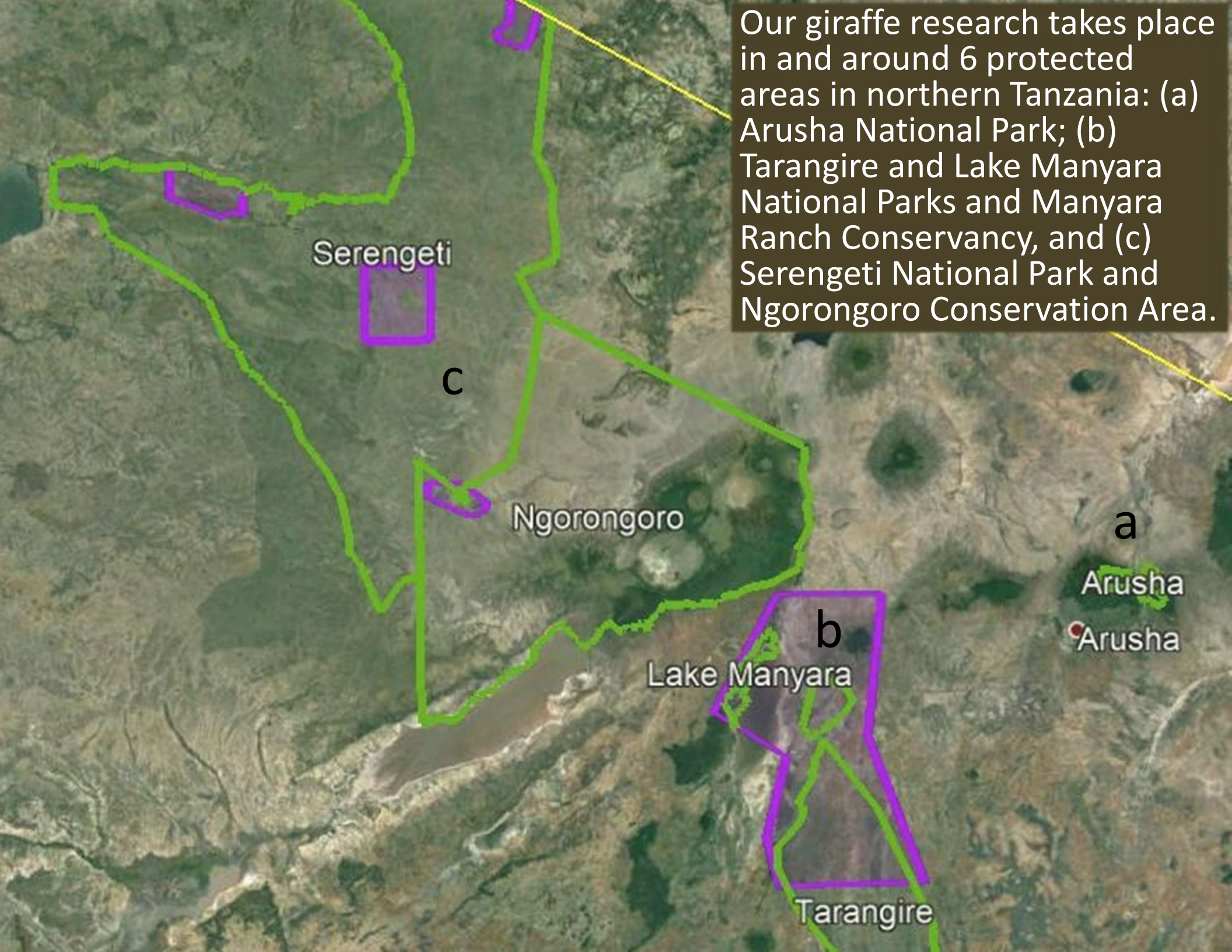
Veila's position is made possible thanks to our partnership with the **Anne Innis Dagg Foundation.**

Masai Giraffe Conservation Science

The goal of our Masai giraffe conservation science is to understand where giraffes are doing well and where they are not, and why, and to protect and connect the places most important for giraffes.

Wild Nature Institute is conducting the world's largest individual-based study of giraffes. We use pattern-recognition software to track thousands of giraffes over their lifetimes to understand their births, deaths, and movements.


Wild animals are facing ever more challenges as they lose habitat and are forced to interact with people in human-dominated landscapes more often.
Animal and human welfare are our highest priorities, so all of our methods are non-invasive and we make sure our program has no negative effects on wildlife or people.


Our giraffe research takes place in and around 6 protected areas in northern Tanzania: (a) Arusha National Park; (b) Tarangire and Lake Manyara National Parks and Manyara Ranch Conservancy, and (c) Serengeti National Park and Ngorongoro Conservation Area.
Serengeti
c
Ngorongoro
a
Arusha
Arusha
b
Lake Manyara
Tarangire

This year we celebrated **10 YEARS** of photographic data collection of individual giraffes in the Tarangire Ecosystem! We completed **3 years** of data collection in the Serengeti-Ngorongoro Ecosystem, and collected a **full year** of data from Arusha National Park.

Big Data for Big Animals

We use an automated program to crop the photos, and a pattern-recognition program to identify each giraffe from their unique spots.

Tanzanians Scientists Collect Much of Our Data:

We are increasing the capacity of Tanzanians to study and conserve their national animal and ensure the long-term sustainability of our Masai giraffe conservation science with training and financial support.

James and driver Emmanuel conduct giraffe photographic surveys in Arusha National Park.

In 2021, together with our colleagues across the globe we published five scientific articles about giraffes:

Bond ML, Lee DE, Ozgul A, Farine DR, König B. 2021. Leaving by staying: Social dispersal in giraffes. **Journal of Animal Ecology** 90:2755-2766.

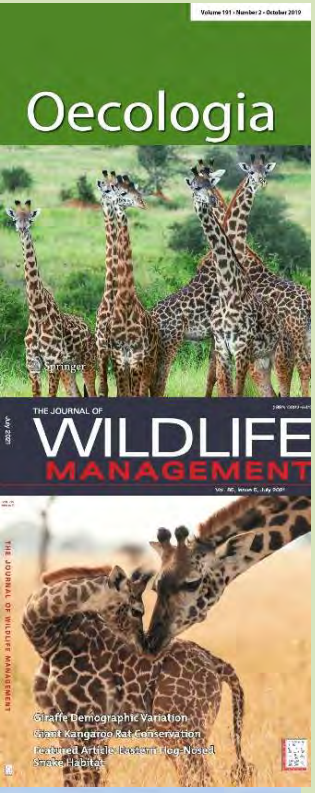
Lavista Ferres JM, Lee DE, Nasir M, Yu-Chia Chen, Bijral AS, Bercovitch FB, Bond ML. 2021. Social connectedness and movements among communities of giraffes vary by sex and age class. **Animal Behaviour** 180:315-328.

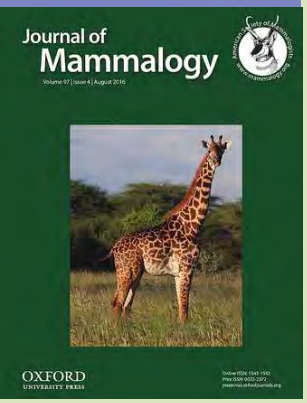
Clavadetscher I, Bond ML, Martin LF, Schiffmann C, Hatt J-M, Clauss M. 2021. Development of an image-based body condition score for giraffes (*Giraffa camelopardalis*) and a comparison of zoo-housed and free-ranging individuals. **Journal of Zoo and Aquarium Research** 9:170-185.

Bond ML, Lee DE, Farine DR, Ozgul A, König B. 2021. Sociability increases survival of adult female giraffes. **Proceedings of the Royal Society B** 288:20202770.

Bond ML, König B, Ozgul A, Farine DR, Lee DE. 2021. Socially defined subpopulations reveal demographic variation in a giraffe metapopulation. **Journal of Wildlife Management** 85:920-931.

Our results inform conservation and land management and help ensure a future for giraffes.





What We Learned About Giraffes This Year:

- Female giraffes that grouped with more other females had higher survival. Benefits of female grouping may include cooperative care of young, more efficient foraging, and reduced stress in general.
- Female Masai giraffes in the Tarangire Ecosystem live in distinct social communities of up to 90 other friends, and although areas used by these communities often overlap, they have different rates of reproduction and calf survival.
- Giraffe calf survival and reproductive rates were higher in the social communities that spent more time *outside* of the national parks, likely due to lower natural predator densities.
- Female social communities overlap in space with one-another, providing opportunities for maturing young male giraffes to disperse socially to find mates, without having to make long journeys into unknown areas.
- Male giraffes in the Tarangire Ecosystem were more socially connected than females to all the other giraffes in the population. Adult males wander long distances looking for mating opportunities, and young males visit many different groups as they explore their social environment before moving away from their mothers and sisters. Females have fewer but stronger and more enduring social relationships than males. Female giraffes have closer ‘friends’ than male giraffes, while males have more ‘acquaintances’ than females.
- The body condition scoring system for giraffes using photographs showed that wild adult males had higher condition than wild adult females, likely reflecting the energetic strain on females due to reproduction, and overall zoo-housed giraffes had higher scores than free-ranging animals.

* WILD NATURE INSTITUTE IN THE NEWS *

Giraffe Science 2021 Media Highlights

Blick | TV News Sport Meinung Politik Wirtschaft People Green Mehr

Schweiz | Uni Zürich erforscht Fortpflanzungsverhalten der Giraffen zum Artenschutz

Giraffen erforscht

Einige junge Giraffenmännchen bleiben ihrem Geburtsort treu

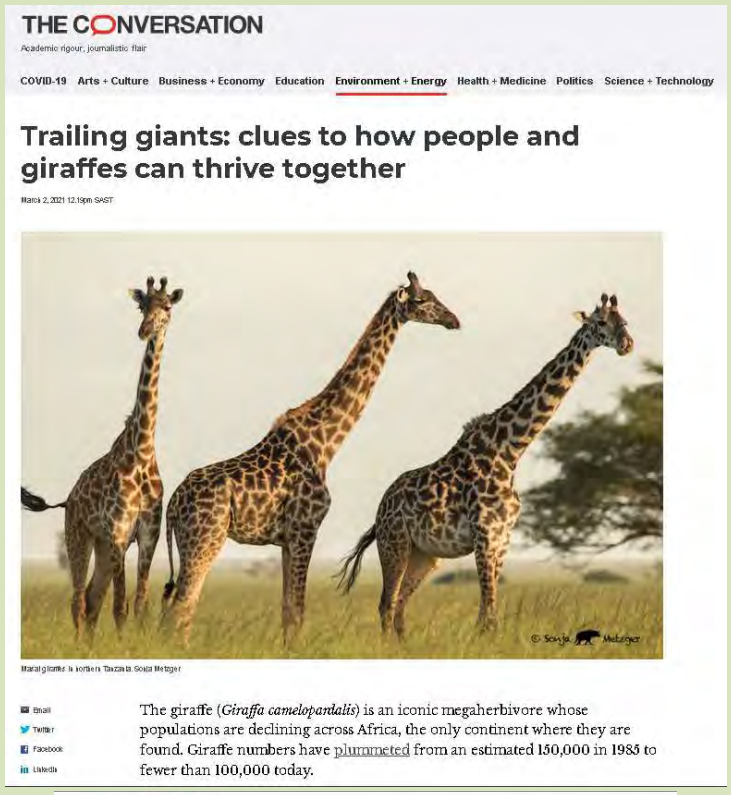
Junge Giraffenmännchen suchen sich neue Gemeinschaften, um sich nicht mit einer verwandten Artgenossin zu paaren. Die Reise ins Unbekannte ist mit Gefahren verbunden. Doch einige Giraffen nutzen eine clevere Strategie, wie Zürcher Forschenden beobachtet haben.

Publiziert: 20.09.2021 um 08:49 Uhr | Aktualisiert: 20.09.2021 um 15:15 Uhr

Andere als Männchen verlassen Giraffenweibchen nur selten die soziale Gemeinschaft, in die sie hineingeboren wurden. Denn bei der Aufzucht ihrer Jungen sind sie auf vertraute Territorien und die Hilfe vertrauter Artgenossen angewiesen.

Das internationale Team um die Biologin Monica Bond von der Universität Zürich beobachtete während sieben Jahren über hundert junge Giraffen in der freien Wildbahn im Norden Tansanias.

Demnach verliessen die meisten männlichen Giraffen ihr Zuhause,



THE CONVERSATION

Academic rigour, journalistic flair

COVID-19 Arts + Culture Business + Economy Education Environment + Energy Health + Medicine Politics Science + Technology

Trailing giants: clues to how people and giraffes can thrive together

March 2, 2021 12.19pm SAST

Masai giraffe in northern Tanzania. Sonja Metzger

Email Twitter Facebook LinkedIn

The giraffe (*Giraffa camelopardalis*) is an iconic megaherbivore whose populations are declining across Africa, the only continent where they are found. Giraffe numbers have plummeted from an estimated 150,000 in 1985 to fewer than 100,000 today.

ScienceNews

ALL TOPICS LIFE HUMANS EARTH SPACE PHYSICS CORONAVIRUS

NEWS ANIMALS

Having more friends may help female giraffes live longer

Being more gregarious might mean added support and less stress

- "Having more friends may help female giraffes live longer" in ScienceNews.
- "Female giraffes who hang out with friends live longer than loners" in New Scientist.
- "L'importance de l'amité chez les girafes!" interview with Monica Bond on FranceInter Radio.
- "Einige junge Giraffenmännchen bleiben ihrem Geburtsort true" in Blick.
- "Trailing giants: Clues to how people and giraffes can thrive together" published in The Conversation by Monica Bond.
- "Jede Giraffe pflegt engere Freundschaften" article featuring Monica Bond in Schweizer Familie magazine.
- "Population ecology of Tanzanian giraffes and wildlife responses to climate change and other threats" Finding Genius podcast interview with Derek Lee.

Plus hundreds more media stories about our giraffe research in other outlets!

Giraffe Science: Building Collaborations

We collaborate with institutions around the world to maximize the impact of our research and education programs.

- **Zoos:** Social scientists from The Living Desert are helping us assess the ways our work is influencing community knowledge, attitudes, and behaviors. Zoos around the U.S.A. provided giraffe photographs and DNA samples for our spot-pattern and body condition research.
- **Microsoft:** We quantified giraffe social networks and published a paper (Lavista Ferres et al.) with scientists from Microsoft AI for Good.
- **Penn State University:** We are studying the genetics of giraffes with researchers from the Eberly College of Science.
- **University of Seville** and **Estación Biologica de Doñana:** We are collaborating with students and researchers to understand interactions between giraffes and other savanna ungulates.
- **University of Zurich:**
    - Veterinarians from Vet Suisse developed a body condition scoring system for zoo and wild giraffes using photographs.
    - We are working with the Population Ecology group to quantify giraffe growth rates and study climate effects on giraffe demography.





Tarangire Ungulate Observatory "TUNGO"

The Wild Nature Institute's landscape-level population research program for ungulates (hoofed mammals)

Grant's gazelle

Kirk's dik-dik

Impala

Common waterbuck

The savanna habitat of the Tarangire Ecosystem is a **global hotspot for ungulates**.

Our TUNGO surveys provide reliable data for scientific management, land-use planning, anti-poaching enforcement, and conservation. We are working with graduate students from **University of Zurich** and **University of Seville** who are using our data to analyze ungulate resource selection and population trends, and to study the effects of climate change on ungulate demography.

Outreach and Advocacy

We presented our giraffe and TUNGO conservation science at several forums in 2021.

February — We talked about giraffes with 30 kindergarteners and first graders from Global Idea School in Seattle.

March — We presented our giraffe and ungulate research to 100 people from the Ungulate Taxon Advisory Group of the Association of Zoos & Aquariums.

June — We presented our giraffe natal dispersal research at the American Society of Mammalogy's annual meeting.

December — We handed out 50 summaries of our giraffe research to government wildlife managers, professors and researchers, and representatives from NGOs at the Tanzania Wildlife Research Institute's biennial conference.

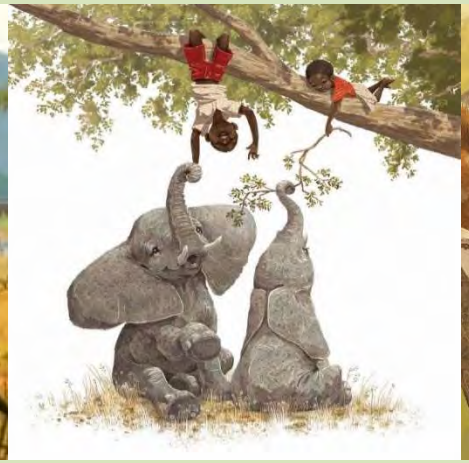
James Madeli attends the TAWIRI conference in Arusha, Tanzania in December

Environmental Education

CELEBRATING AFRICA'S GIANTS

Giraffes, elephants, rhinoceroses, and wildebeests are Africa's giants. These mammals play critical ecological roles in the places where they live, but their numbers have plummeted because of conflicts with humans.

Our team of researchers, educators, illustrators, and designers has developed innovative educational materials and activities for children in Tanzania and abroad. The materials use Africa's giants to teach biology, ecology, geography, science, math, language skills, art, and conservation. The activities inspire children, parents, and teachers to care for wildlife in fun, exciting, and creative ways.



Special Thanks to Chris Barela, David Brown, Bory Chung, Kayla Harren, Lise Levy, Bridget Mathews, Megan Strauss, and Sophie Tremblay

Our Celebrating Africa's Giants Education Program Has 4 Main Elements:

Classroom Education

Tree Planting

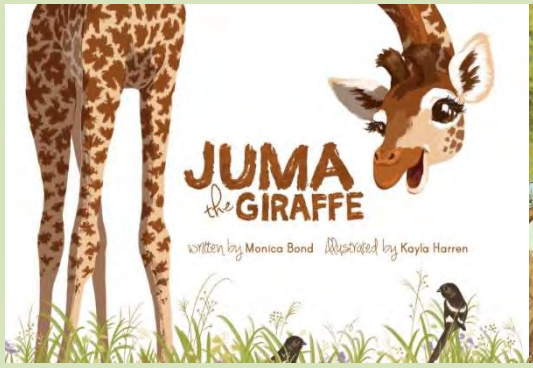
Fun Days

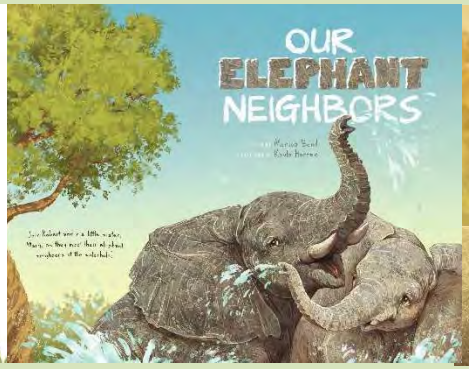
National Park Visits

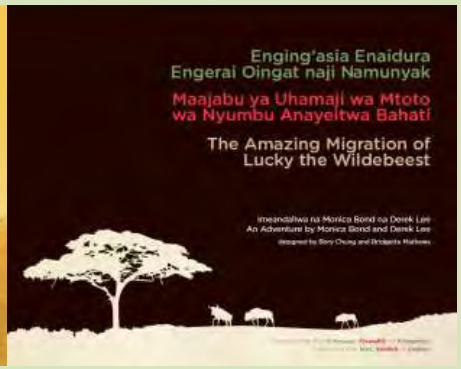
Environmental Education

CELEBRATING AFRICA'S GIANTS: Classroom Education

- Four full-color bilingual (Swahili and English) story books with associated lesson plans.
- Two activity books in Swahili.
- Giraffe, elephant, rhinoceros, and wildebeest educational posters.
- A website–**www.AfricasGiants.org**–where materials, lesson plans, and activities are freely available.
- Educator training on how to develop and implement innovative, effective, conservation-oriented teaching strategies.
- A mobile education program "Giraffe/Elephant/Rhinoceros/Wildebeest in a Box" to implement the lesson plans and activities in Tanzanian classrooms and provide the necessary supplies.







* CELEBRATING AFRICA'S GIANTS ACROSS BORDERS *

Wild Nature Institute donated 150 of our Celebrating Africa's Giants books to 25 primary school libraries in Kenya, in partnership with Books Are Power, Inc.
These libraries together serve more than 7,000 Kenyan primary school children per year.

This year *Juma the Giraffe* was published in German for visitors to Tierpark Berlin!

Environmental Education

CELEBRATING AFRICA'S GIANTS: Classroom Education

In Tanzania our program has **trained more than 200 teachers** and **reached over 27,000 school children** across the country.

In 2021, Wild Nature Institute's Anne Innis Dagg Education Coordinator, Veila Makundi, visited classrooms at **11 schools** in the Tarangire region a total of **159 times**, teaching **1,338 individual children** (617 girls and 721 boys) about biology, ecology, math, Swahili and English, art, and conservation using our story books, lesson plans, and activities. This includes children of many ages, from Form 2 through Form 7.

Environmental Education

CELEBRATING AFRICA'S GIANTS: Planting Trees

This year a total of 561 students from 5 schools planted **400 native trees** on school grounds and at a local hospital to improve wildlife habitat and to learn the importance of trees for a healthy planet.

Environmental Education

CELEBRATING AFRICA'S GIANTS: Giraffe Fun Days

Wild Nature Institute with Esilalei Primary school celebrated Tanzania's national animal by hosting a Giraffe Fun Day. The event attracted **500 students** as well as teachers and elders from the local Maasai community. Kids built a giant giraffe sculpture out of trash collected from around school, played sports (team Giraffe vs team Rhino!), drew pictures of wildlife, and danced and sang traditional songs. The kids also received We Protect Giraffes t-shirts and a delicious meal of vegetables, pilau, and beans, so that they connect giraffe conservation with food and fun! The aim was to raise awareness that giraffes are endangered and remind the community that it is everyone's responsibility to protect Earth's tallest animal.

Environmental Education

CELEBRATING AFRICA'S GIANTS: National Park Visits

Wild Nature Institute brought children to Lake Manyara and Tarangire National Parks on 6 trips in 2021. In total, **112 children were able to experience giraffes and other wildlife** in a fun, relaxed setting—their first trip to their backyard national parks. For two of the trips to Tarangire National Park, a trained guide was "loaned" to us by the safari company Matembezi. Thanks to Onesmo and Matembezi, the children's experience was enriched through interpretation, so they were taught about savanna ecology while directly observing the wildlife and landscape. The kids also learned how to view the world up-close through binoculars. They enjoyed seeing first-hand what is so special about wild nature in their magnificent African homeland.

Snag Forest Campaign

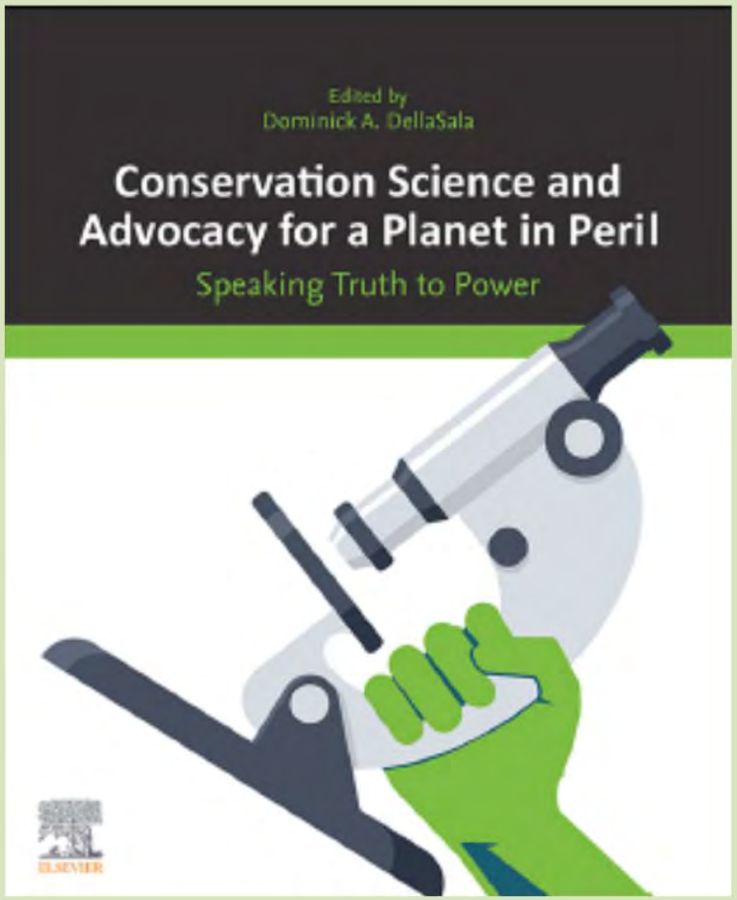
We study wildfire and wildlife to protect biodiversity in burned forest habitats.

Wild Nature Institute's research has revealed that forest fires usually do not harm Spotted Owls, and fires create more benefits than costs.

Problems arise for the Spotted Owl when people cut down the trees, living or dead, that owls need for nesting, roosting, and perching while hunting.

<u>In 2021, Wild Nature Institute scientists</u>:

- Published a scientific paper in the journal *Birds*: **Disentangling post-fire logging and high-severity fire effects for Spotted Owls** showed that studies reporting negative effects of fire on Spotted Owls are confounded by post-fire logging.
- Submitted expert comments to the U.S. Fish and Wildlife Service about Northern Spotted Owl Critical Habitat and to the U.S. Forest Service about Mexican Spotted Owl habitat protection in the Southwest.
- Published a chapter **When scientists are attacked: strategies for dissident scientists and whistleblowers** in a new book "Conservation Science and Advocacy for a Planet in Peril" published by Elsevier.



* WILD NATURE INSTITUTE IN THE NEWS *

Spotted Owl 2021 Media Highlights

Locus Focus, January 11, "**Magic Forests After Fires"** KBOO radio interview with Monica Bond.

"Owls, Woodpeckers, and Smokey Bear" podcast interview with Monica Bond on Naturally Dave podcast January 23.

Great Old Broads for Wilderness webinar March 9, **"Some Like It Hot"** with Monica Bond, 80 participants.

Los Olivas Rotary Club webinar April 15, **"Spotted Owls and Wildfire"** with Monica Bond, 25 participants.

Wild Earth Guardians webinar June 9, **"Fire and Forest Ecology in the American West"** with Chad Hanson and Monica Bond, 87 participants.

The Wildlife Society annual conference December 6, **"Wildlife Ecology and Forest Management for Spotted Owls, From Conflict to Coexistence"** presentation by Derek Lee.

Our Major Donors and Supporters

Tierpark Berlin · Anne Innis Dagg Foundation · Sacramento Zoo

Tulsa Zoo · The Living Desert · World Giraffe Foundation · Environment Now

Microsoft Azure · Columbus Zoo · Cincinnati Zoo · Toronto Zoo · Save the Snakes

&Beyond Asilia Africa Tarangire Safari Lodge Nomad Tanzania Matembezi

Plus a big thank-you to all Wild Nature Institute's wonderful individual donors

Our Partners

Pennsylvania State University

Conservation Congress

John Muir Project

Manyara Ranch Conservancy

Microsoft AI for Good Research Lab

Ngorongoro Conservation Area Authority

Nelson Mandela AIST

University of Zurich

PAMS Foundation

Tanzania National Parks

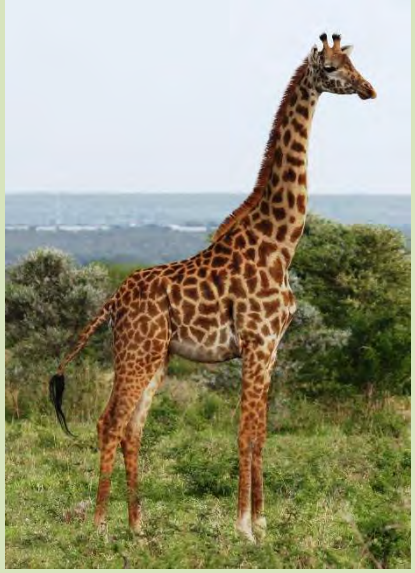
Tanzania Wildlife Authority

Tanzania Wildlife Research Institute

University of Seville/Estación Biologica de Doñana

Statement of Activities 2021

INCOME		
	Grants from Foundations	$ 63,175
	Individual Donations/Family Trusts	$ 21,915
	Contracts	$ 54,000
	Other (Travel Reimbursements)	$ 2,181
Total Income		**$ 141,271**
EXPENSES		
	Field Research (Permits, Vehicles, Equipment, Food and Fuel, Tanzanian Field Assistants, Lab Fees)	$ 43,177
	Travel	$ 1,541
	Conferences/Meetings/Membership Fees	$ 775
	Services (Contract Research, Education Materials Design & Illustration, Printing Books)	$ 17,970
	Mailing and Office Expenses (Rent, Phone, Utilities)	$ 17,639
Total Expenses		**$ 81,101**
Starting Balance (carryover from 2020)		**$ 60,552**
Income - Expenses		**$ 60,170**
Ending Balance		**$ 120,772**



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WILD NATURE INSTITUTE

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