

PR AWARE

CONSERVATION & PHOTOGRAPHY
NOV / DEC 2019



GIRAFFE
BY PETER HUDSON

CONTENTS

EDITOR'S DEN

Welcome to PT Aware
By Raghul Patteri

04

FOUNDERS' NOTE

By Hermis Haridas &
Nisha Purushothaman

07

THE STORY

Giraffe: All neck & legs but
how many species?
By Peter Hudson

08

YOUR GALLERY

30

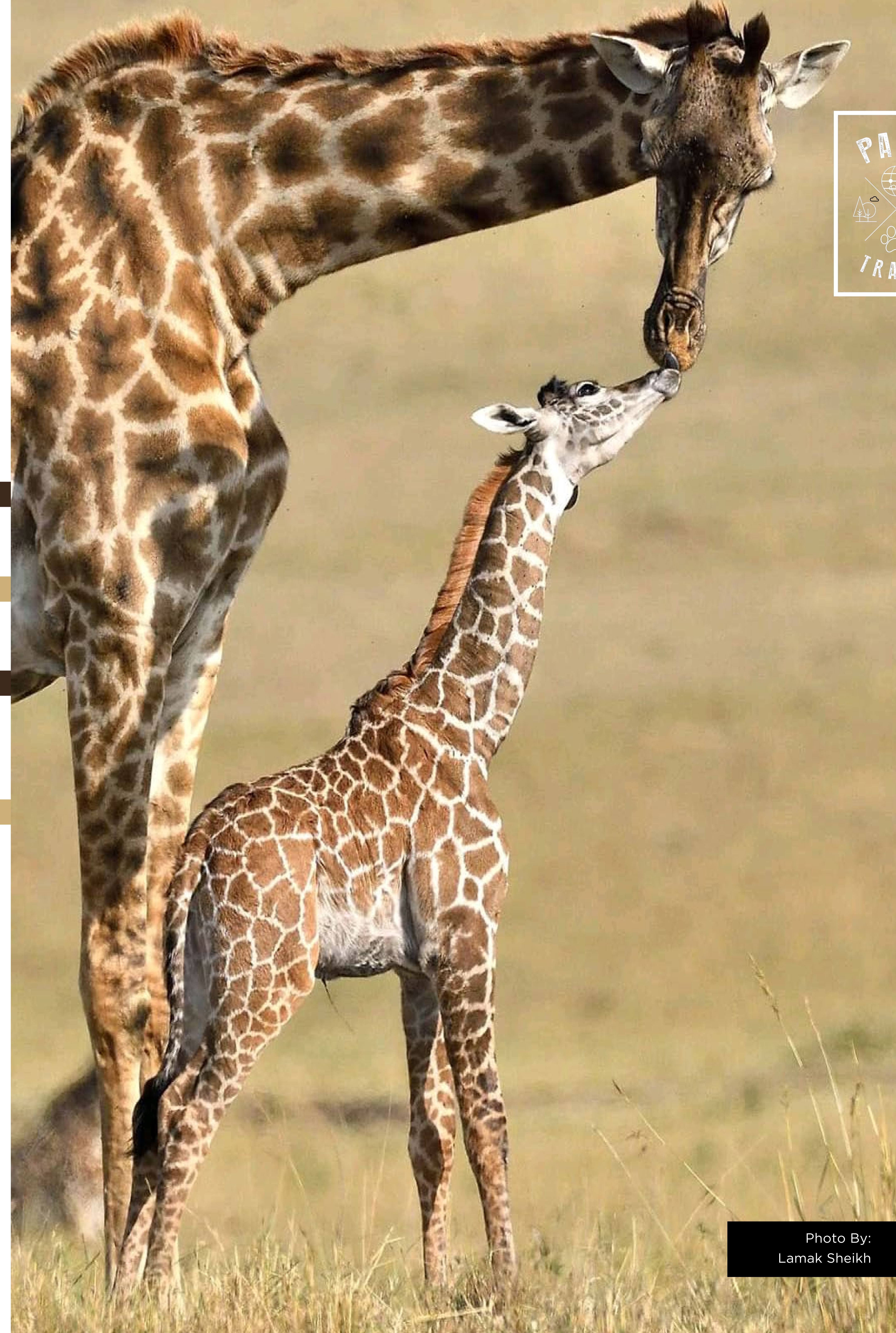
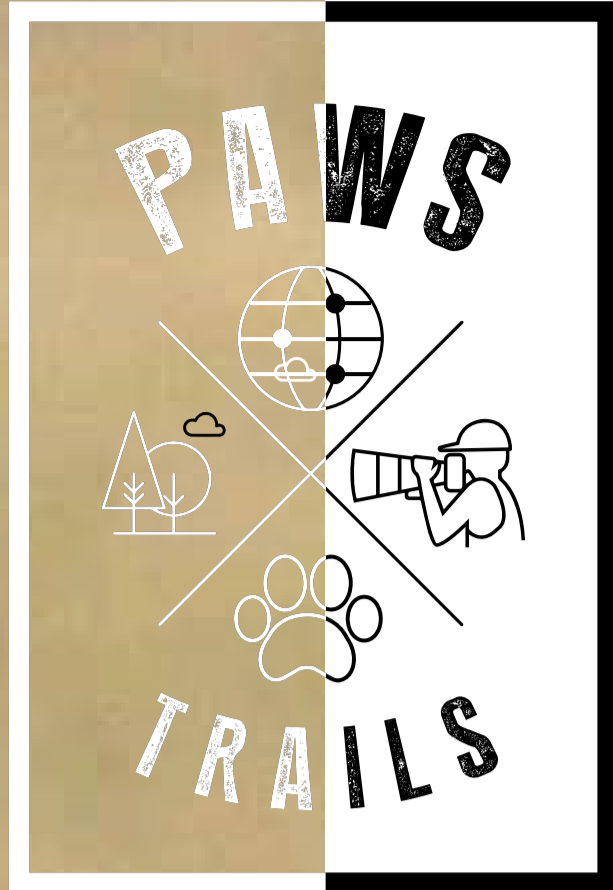


Photo By:
Lamak Sheikh

Publisher: Paws Trails Explorers **Editor:** Raghul Patteri **Conservation Director:** Peter Hudson
Content Director: Nisha Purushothaman, **Director Photography:** Hermis Haridas, **Design desk :** Nithya Purushothaman
Copyright © Paws Trails Aware



Raghul Patteri
Editor

Welcome to the sixth edition of PT Aware.

Giraffes are the towering giants of the animal kingdom. Found only in Africa, they are the tallest animal inhabiting earth today and a true marvel of evolution. They need their height to reach their favorite foods, and to avoid competition from other prolific browsers who clean off the lower branches. Their anatomy is truly marvelous with a heart designed to pump blood to their brains which reside way above on the elongated necks. While watching them strut their stuff on the vast African plains, you really feel the power and ingenuity of nature and feel a reassurance that nature will find a way to survive, whatever the odds are.

But is nature's ingenuity enough to save the Giraffes? In this edition of PT Aware Dr.Peter Hudson explores the intriguing facts of the Giraffe's life and the many threats posed to their survival. The field of conservation is subjective and evolutionary in nature, and the conservation status of species change with the availability of latest research and data. This article will show how an animal thought to be doing reasonably well, might actually be facing grave threats as inferred from latest research. Learn about the growing importance of DNA research in conservation, and how this influences categorization and policies.

PT Aware brings you interesting facts about different species and conservation issues from around the world. We associate with brilliant scientific minds and gifted photographers to bring you the best of both worlds, the latest scientific perspective and spectacular photographs. Thanks to all the wonderful photographers who shared their giraffe images for this edition. Our next edition will focus on the Bengal Tiger, so prepare to upload your photographs of these iconic cats. Selected photographs will be published to portray the story of these fearsome cats.

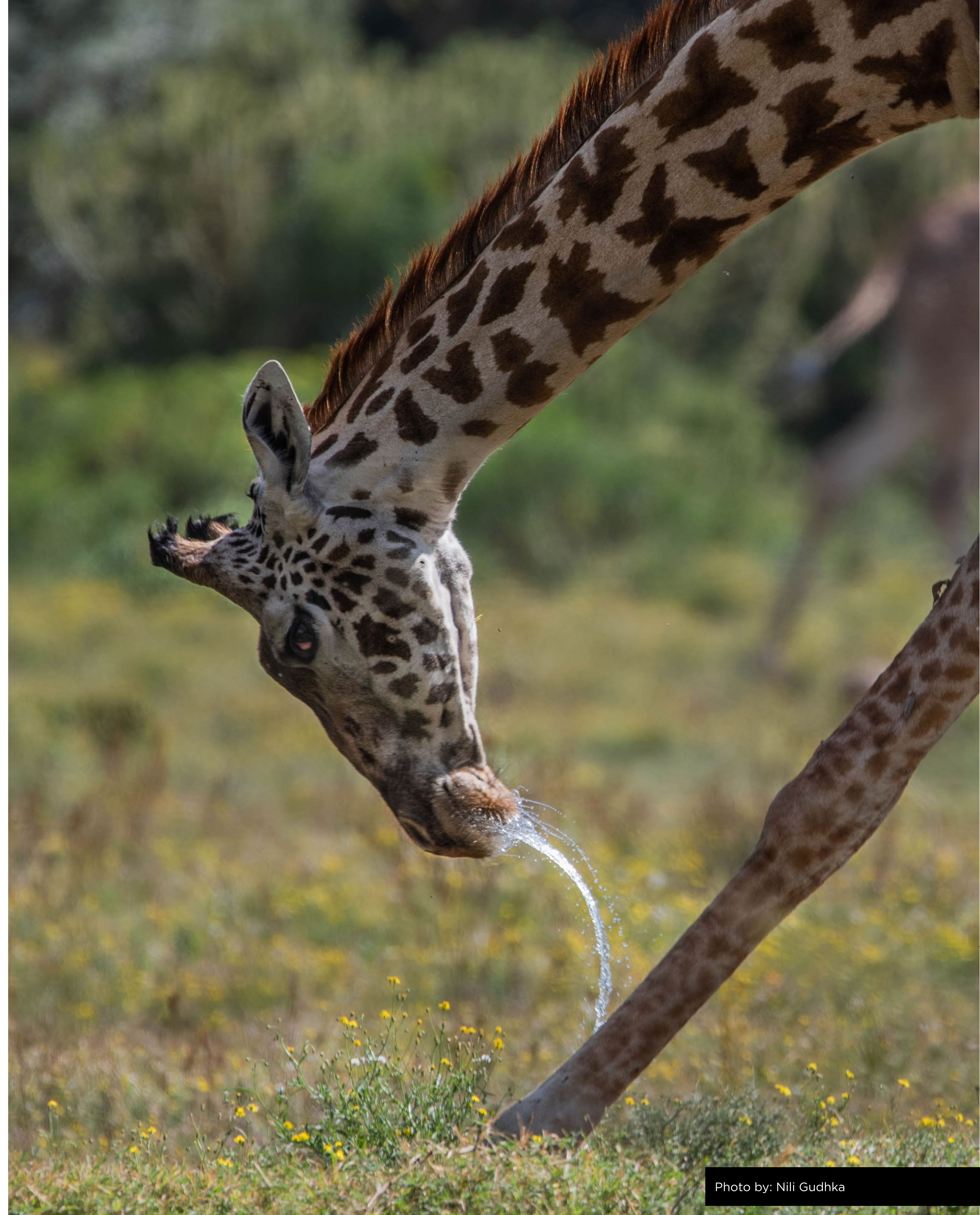


Photo by: Nili Gudhka

EDITOR'S DEN

The background of the page is a photograph of three giraffes in a savanna landscape at sunset. The giraffes are silhouetted against a bright orange and yellow sky. One giraffe is in the foreground, looking towards the right. Two other giraffes are behind it, one to the left and one to the right, also looking towards the right. The ground is dark and appears to be a grassy plain.

FOUNDERS' NOTE

The African landscape is incomplete without the towering figure of a giraffe headlining it. These giants of the animal kingdom are a sight to behold and sparks a sense of surrealism when you observe them. And there is no denying it – they are photogenic! A giraffe silhouetted against the twilight sky is a cherished shot for photographers in Africa.

It is great to observe the many moods of the Giraffe, from gentle giants who graze lazily at the lofty tree tops, they transform themselves to fearsome fighters who rain hammer blows with their formidable necks while defending territory or claiming a mate. And then, there is the gallant defender, who can dislocate a lionesses jaw with a single back kick when threatened.

It is a sad truth that these animals are hunted for bush meat, folklore medicine and for the curio trade. Another example of human greed and misconceptions threatening the survival of a species. And as is the case with many species, habitat destruction across Africa is harming the giraffes. It is high time we realized this and put a stop to our destructive activities.

We have news – proudly announcing the launch of Nature Art Trails Institute, Dubai – the newest Paws Trails initiative. This institute is conceived as a center for photography & fine art with an onus on nature, wildlife and conservation. Our programs will imbibe and promote the spirit of conservation and peaceful co-existence with other fellow beings. We aim to become the premiere institute in Dubai in this space.

Thanks to all the wonderful photographers for your Giraffe images. It is the aim of Paws Trails to use community photography as a powerful tool for conservation. Please keep contributing and let your images tell the tales of enigmatic species from around the world to our readers worldwide.

www.pawstrails.com/register

Hermis Haridas & Nisha Purushothaman

Founders - Paws Trails Explorers

THE STORY

Giraffe: all neck & legs but how many species?

By Peter Hudson,
Conservation Director,
Paws Trails





Peter Hudson is a scientist, photographer and conservationist. He undertook his first scientific expedition to Africa at the age of 21 and has been a regular visitor ever since. Passionate about nature, he manages his own 36-hectare nature reserve in Pennsylvania which is home to bears, bobcats and other animals.

In his professional career, Peter is the Willaman Professor of Biology at Penn State University. The focus of his research has been the infectious diseases of wildlife and in particular how new diseases emerge. He has been running scientific studies on the wolves in Yellowstone, tortoises in the Mojave Desert and bighorn sheep in Idaho. He is currently involved in a major project in Australia investigating the viruses associated with bats.

Peter established a new global health institute at Penn State that seeks to develop the concept of One Health, whereby the future health of humans is dependent on that of the environment, livestock management and the conservation of wildlife. He is an adjunct Professor at The Nelson Mandela African Institute of Science and Technology based in Arusha, Tanzania and a Fellow of the Royal Society.

peterhudsonphotos.com

[instagram.com/peter_hudson018](https://www.instagram.com/peter_hudson018)



I have always been fascinated by the fact that so many animals look similar and yet there are a few that stand out as being very different. By far and away the majority of the ungulates are sort of similar with a long nose, horns and long running legs. Most of the cats look similar although the coat color shows some fascinating variations – spots and stripes in every combination. Then there is a group of animals like the elephant with its long trunk and big ears, the camel with its humps and huge lips and of course the giraffe with the characteristically long neck and legs that just break the mold and are so totally different. Really easy for children to identify and yet being so different makes them vulnerable to human induced changes in the world.

How did the giraffe get that neck?

The discussion on how the giraffe got its long neck has been a discussion point in biological circles for many years, and even now we can't say categorically how this happened. Darwin argued that it arose through competition with other browsers. The efficient browsers like kudu and impala take the leaves that are within reach leaving few for the giraffe, so encouraging the giraffe to grow long legs and neck to reach those leaves the others could not reach. Observations show that giraffes do indeed bite off more leaves at higher levels where the other species are unable to reach

them compared to the amount they get at low levels. However, there is a cost to growing those long necks; those giraffes with longer necks need more nutrients to maintain the long-necked lifestyle and suffer a higher mortality during droughts than those with shorter necks. If you have a long neck and long legs then there are also some big physiological issues you must face – the brain needs oxygenated blood to function, so the giraffe has to have a “turbo-charged” heart, the greatest blood pressure of any known mammal and thickened veins to pump the blood to the brain. What is more, they also need special adaptations when they lower their heads to drink to stop the blood rushing to the head. A recent paper by my good friend Doug Cavener¹ compared the genes of the giraffe with its closest relative, the okapi and showed that 70 genes in the giraffe have become specially adapted to allow this lifestyle and many of these genes are involved in cell proliferation and growth.

There are alternative explanations to why giraffes have long necks. Females find males with long necks more attractive and so select these males as the fathers of their offspring. As such the long neck can be considered a secondary sexual characteristic that females select and this can get emphasized over time, much like the peacock's tail. Intriguingly the necks are used when males fight and if you have ever watched two males fight for dominance the sledgehammer blows they use on each other really

are brutal and so females maybe selecting.

How many giraffe species are there and what are we conserving?

If I told you that back in the 1980s the estimated size of the African giraffe population was thought to be

about 155,000 individuals, then in 2016 the IUCN estimated less than 100,000 and now a more recent and more accurate estimate reckons there are about 110,000 individuals, then you would guess that the giraffe population was not suffering as badly as many other African megafauna. Indeed, the IUCN

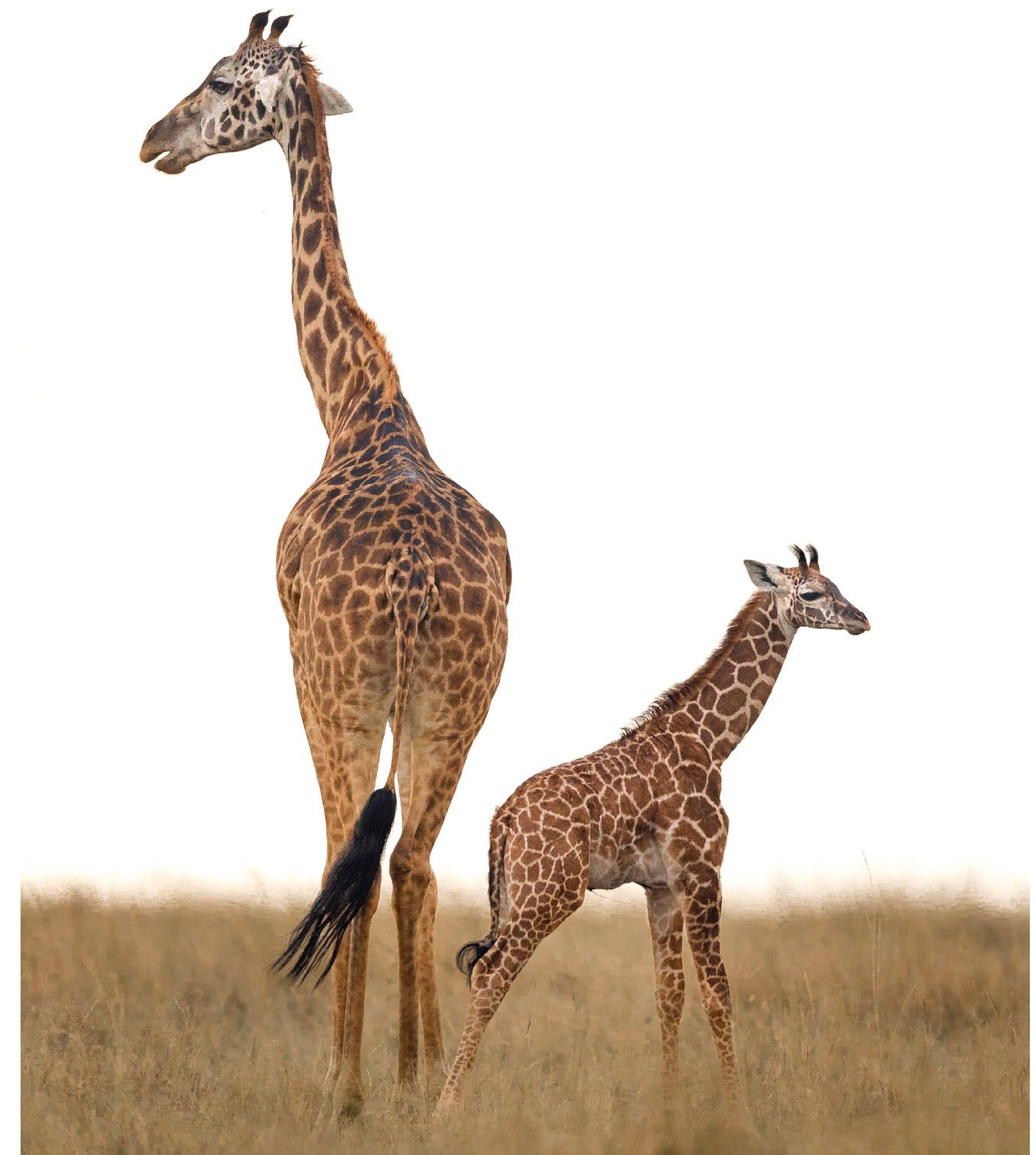


Photo by: Surya Narayan Mohapatra





consider the giraffe as **vulnerable**. This means the species is likely to become endangered unless the circumstances that are threatening its survival and reproduction improve and the usual cause of this demise is through habitat destruction.

However, this estimate of the giraffe population assumes we are looking at just one species, and the IUCN have already pointed out that three of the subspecies are in a bad way: Kordofan and Nubian are listed as **critically endangered** and reticulated as **endangered** and in need of immediate action. They have been working on the belief that the giraffe is one species with nine subspecies and now, recent research has proposed there should be four species of giraffe and have asked the IUCN to consider this information and the conservation status of each proposed giraffe species and so provide action plans for each species.

To investigate how many species of giraffe there really are in Africa, Julian Fennessey² from the Giraffe Conservation Foundation collected DNA from multiple giraffe populations throughout Africa, and for the first time, sampled all nine subspecies including the rare Nubian giraffe from Ethiopia. The samples were then taken to Axel Janke's lab at the Senckenberg Biodiversity and Climate Research Centre in Frankfurt for the extraction of DNA. Fundamentally, DNA can be divided into two types - the nuclear DNA in

the cell nucleus, which is derived from both parents, and then DNA in the mitochondria, an important organelle that sits in the cell and uses nutrients to make energy. This mitochondrial DNA is derived only from your mother, since at fertilization the sperm provides just nuclear DNA for the young embryo and all the mitochondria comes from the mother's egg. As such this mitochondrial DNA can be traced back from mother to grandmother and back through to the equivalent "eve" without the complications arising when DNA reshuffles with male DNA. What is more, the mitochondrial DNA exhibits an elevated mutation rate, so looking at the base sequence is a very useful way for working out the relationship between populations and species. What Janke and his team did was to separate the mitochondrial DNA and nuclear DNA from the samples and compare them between samples of giraffe. They found several clear signals indicating that the giraffe is not one species but indeed four different species with five subspecies and providing a good explanation for much of the confusion that existed before this analysis. The proposal is summarized in Figure 1 and will identify the southern giraffe (*G. giraffa*), which includes two subspecies — the Angolan giraffe and South African giraffe found in South Africa, Namibia, Botswana, Zambia and Zimbabwe; the Masai giraffe (*G. tippelskirchi*), comprising of the Thornicroft's giraffe subspecies found mainly in Tanzania,

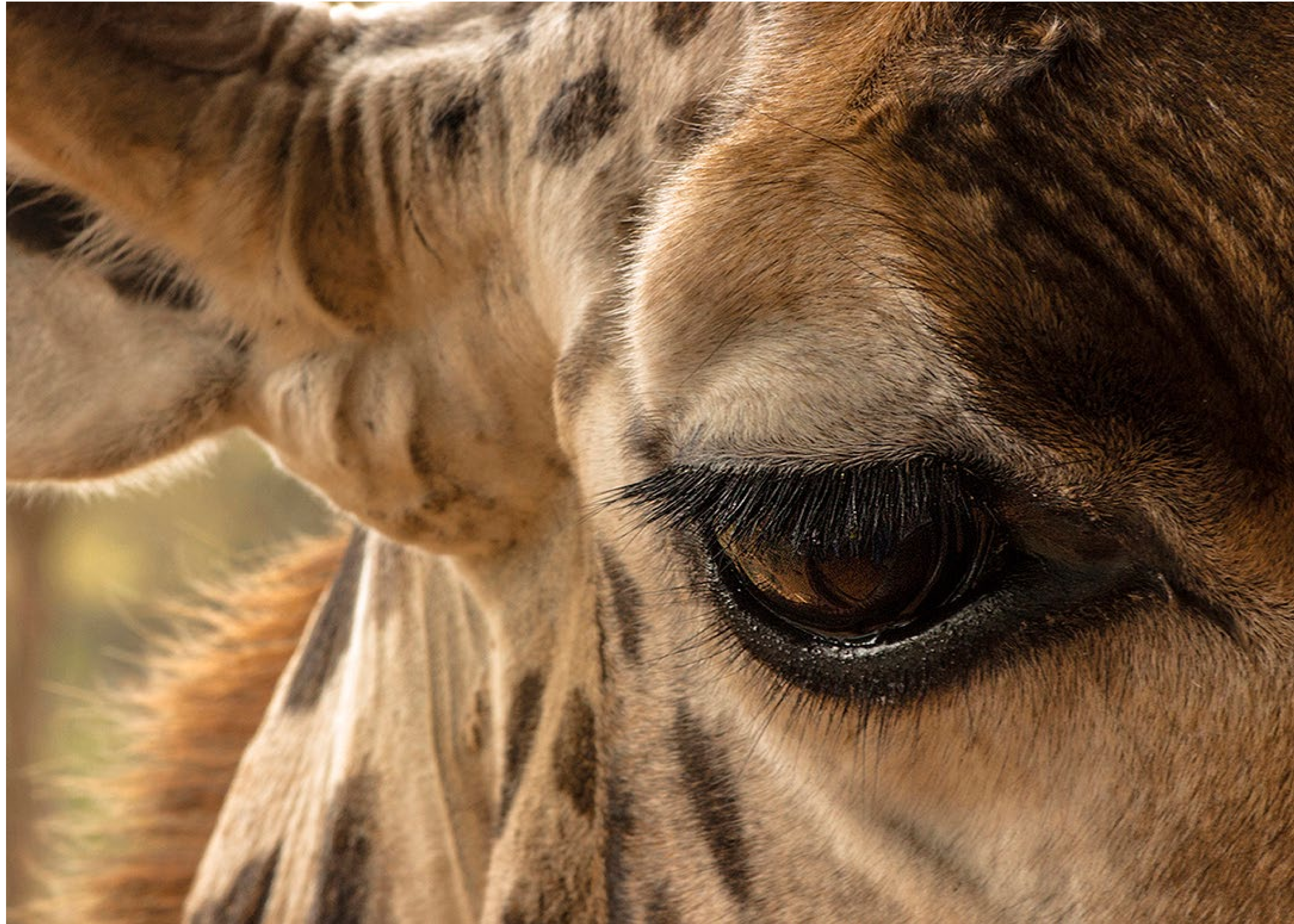


Photo by: Diana Rudenko

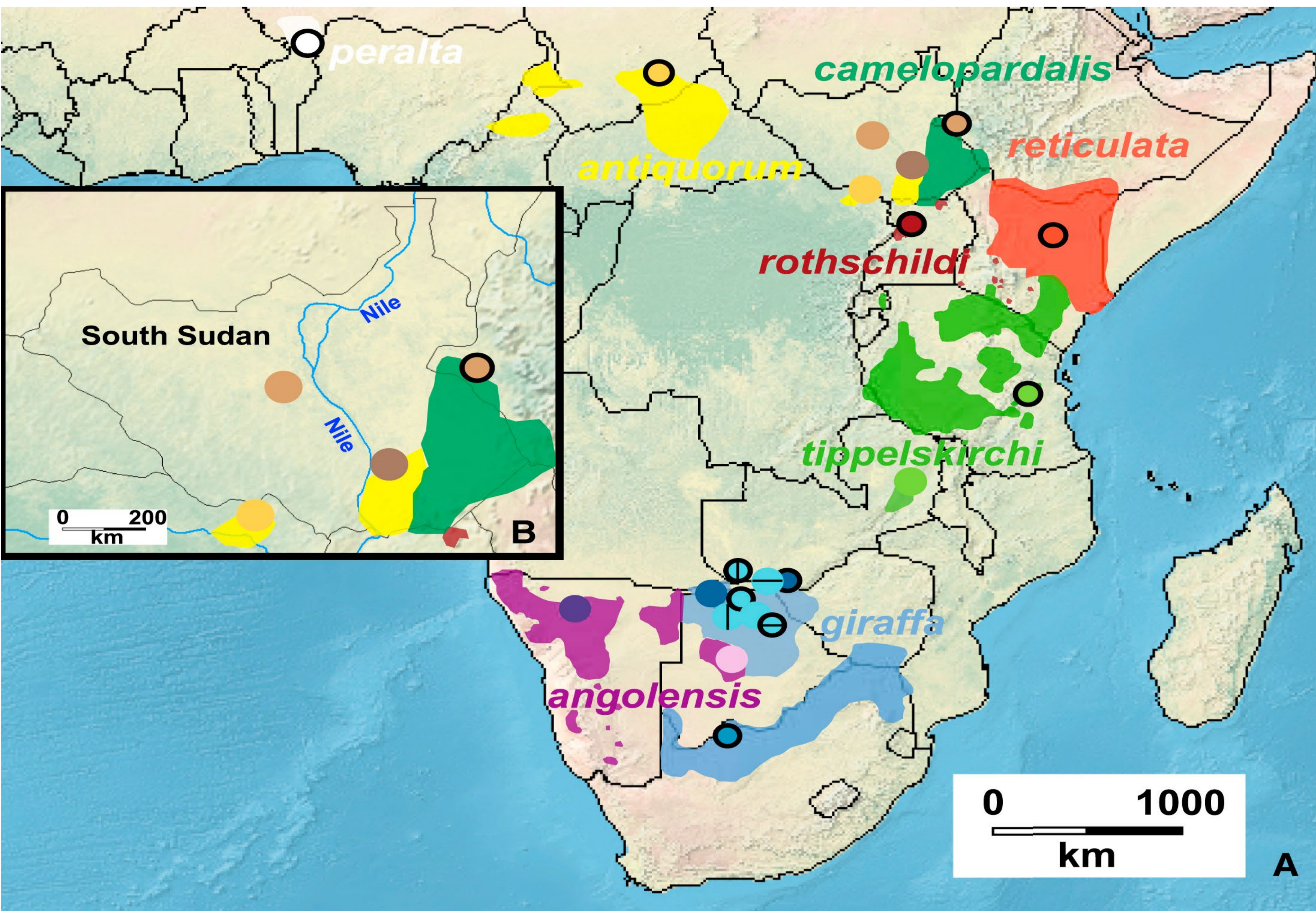


Figure 1A: The current distribution of the 9 subspecies of giraffe showing where DNA samples were collected.

Kenya and Zambia; the reticulated giraffe (*G. reticulata*) found in Kenya, Ethiopia and Somalia; as well as the northern giraffe (*G. camelopardalis*), found in eastern and central parts of Africa.

Dramatic changes like this in the taxonomy of any species, let alone the charismatic megafauna, attract attention from other scientists and it is not surprising there has been comments. While the 195 samples

collected for analysis is the first inclusive comparison of giraffe genetics, there is only a handful of samples from the rarer subspecies and so people are warning that the conclusions should not be considered definitive. As such the alternative view is that this is a new perspective on giraffe taxonomy but, as yet, one that should not be accepted totally without further investigation.

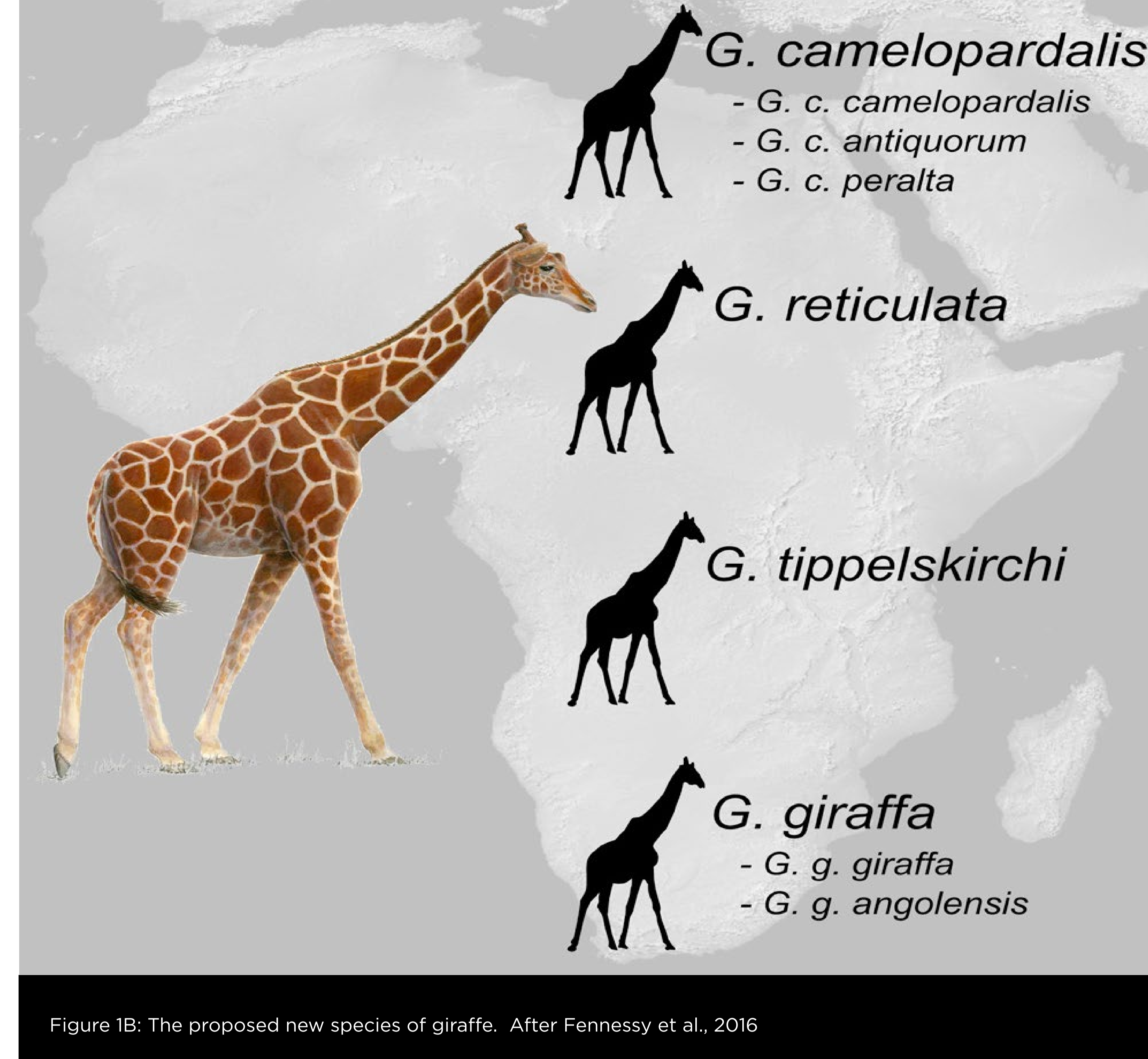


Figure 1B: The proposed new species of giraffe. After Fennessy et al., 2016

The IUCN are currently examining these findings and if they accept the number of new species, they will now revise the listings for every species and this should have a major impact on giraffe conservation action. If they embrace these findings then all of the giraffe species must be protected, and with special attention focused on what will be the status of the northern giraffe and the reticulated giraffe. Each of these species has fewer than 10,000 individuals and numbers are falling fast. There is a parallel here with the African elephant which was originally considered one species

and then in 2010 divided into two species: the forest and the savannah elephants and this resulted in increased calls for extra protection.

Much of the threats to giraffe are based around habitat destruction, in particular the acacia savannah resulting in reduced food, but they are still hunted for bushmeat. There are even more sinister reasons why giraffe are disappearing at a rapid rate. In Tanzania, there are reports that people think the bone marrow and brains are a cure for HIV AIDS. Giraffe bone legs are being sold to be carved to look like ivory and in



DRC, giraffe tails are used as high class fly swats and are part of marriage dowries. At the end of the day we need to be worried about giraffes; not only are they just so strange looking but they are a critically important species in the

savannah ecosystem and in much need of protection and support.

References

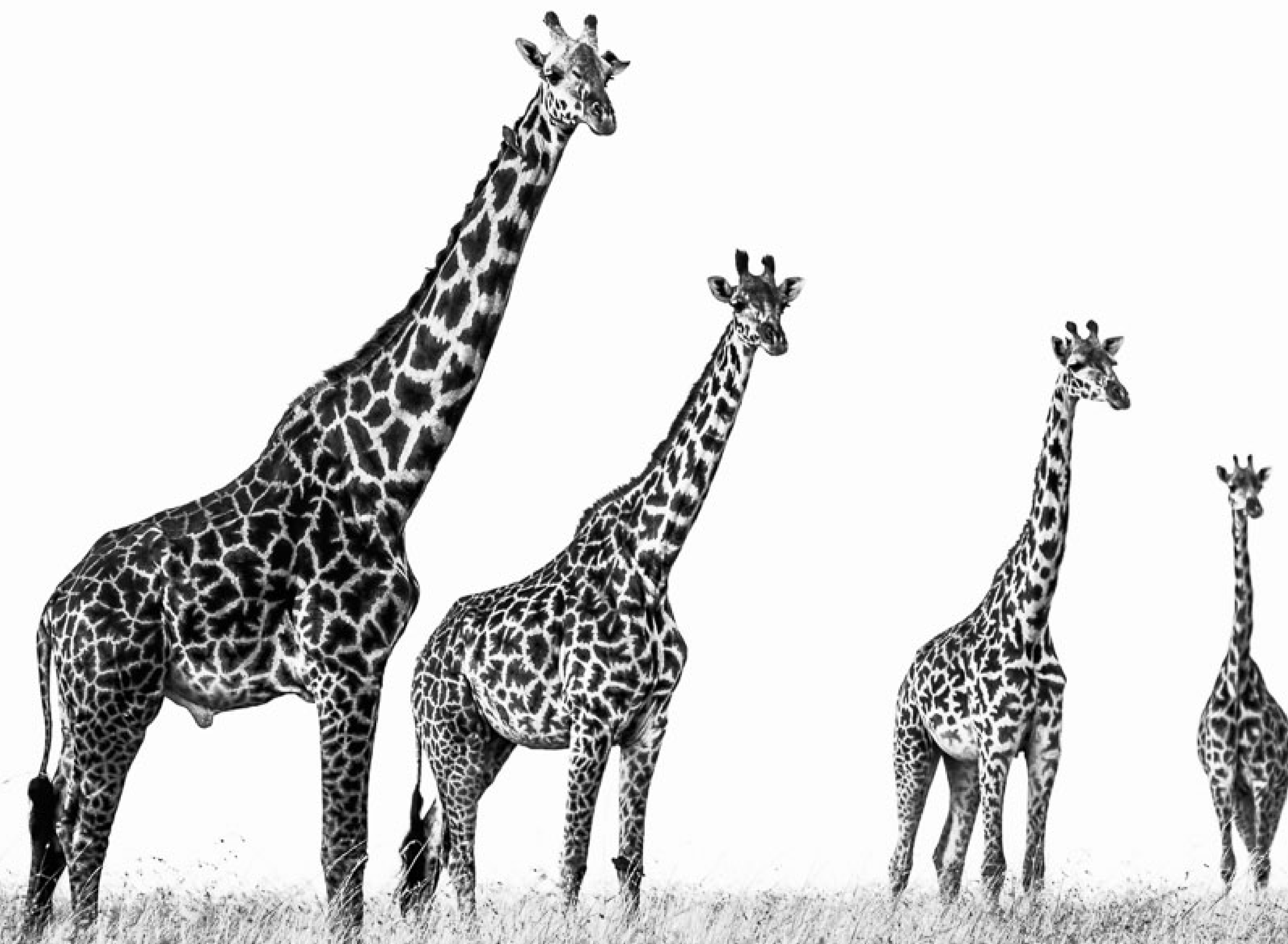
¹ Agaba, M... Cavener, D. 2016. Giraffe genome sequence reveals clues to its unique

morphology and physiology, Nature Communications, 7, 11519

² Fennessy, J., Bidon, T., Reuss, F., Kumar, V., Elkan, P., Nilsson, M.A., Vamberger M., Fritz, U & Janke, A., 2016. Multi-locus Analyses

Reveal Four Giraffe Species Instead of One. Current Biology 26, 2543-2549

³ Shorrocks, B., 2016. The Giraffe: Biology Ecology Evolution and Behaviour. Wiley 232pp.



What can you do to help giraffe conservation?

1. Encourage a young person to respect and admire giraffes by adopting an orphaned giraffe and giving it as a gift. I did an adoption for my granddaughter through The Sheldrick Wildlife Trust and hope to take her to Kenya so they can meet one day. You can also adopt a giraffe through the websites of the Giraffe Conservation Foundation or the World Wildlife Fund

2. We know surprisingly little about giraffes (Look at the giraffe book by Bryan Shorrocks if you want more information³) so **making a donation to one of the giraffe conservation** groups is a good thing to do. You can donate to Wild Nature Institute or to the Giraffe Conservation Fund, both of whom are undertaking important conservation research and taking action to protect giraffes.

Talk with them first and find out how your money will be spent and tell them what you want it to support. At the same time you may have skills that could help them, you could donate your photos for them to use or you may have skills with the internet, social media, accountancy, vehicle repair or be keen to lend a hand in the field that could help the running of these foundations – by

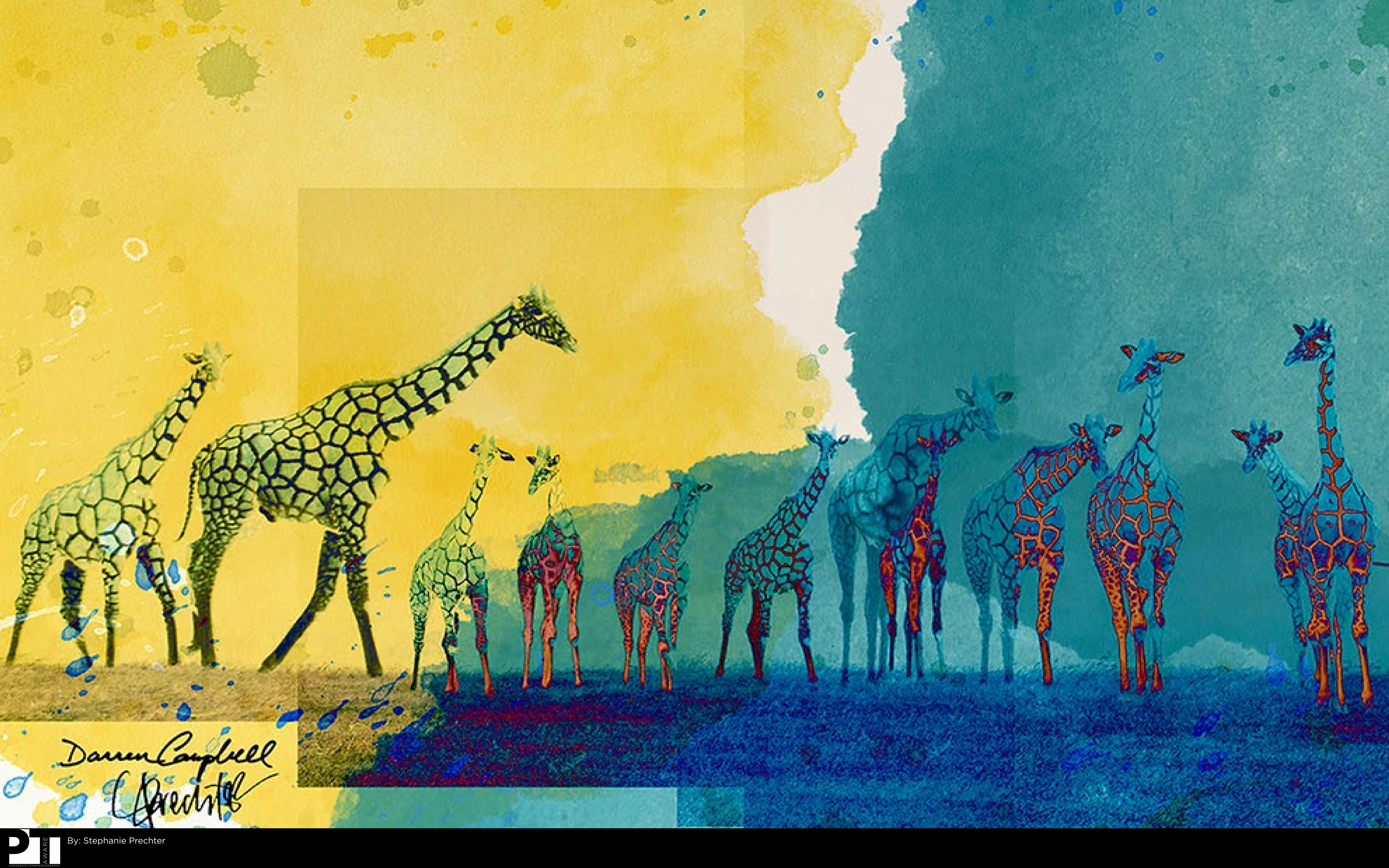
definition they are run on a shoestring so anything you can do will be helpful.

3. Increase awareness within your social circles and beyond by **posting your photos** on social media, talking at your local schools and making people aware of the issues facing this charismatic species. Make a big splash on June 21, when it is world giraffe day and use the hashtag #standtallforgiraffe.

4. Giraffes feed primarily on the leaves and twigs of acacia, mimosa, and wild apricot trees and yet these are being destroyed so **support tree planting** and rewilding efforts in Africa. Organizations such as One Tree Planted, Trees for the Future and the Ethiopian government have dramatic tree rewilding programs that need money for tree cultivation and protection – you can find these all online. Or you can go out and help people plant.

5. Become involved in a **giraffe citizen science** project if you are visiting Africa. Projects like Zooniverse.com where you record statistics about giraffes and submit them to a researcher who aggregates the results and uses them to improve understanding and conservation.






Darren Campbell
Illustrations





 Photo by: Peter Hudson



 Photo by: Shaji Panicker



PT. AWARE Photo by: Karen Huynh



PT. AWARE Photo by: Nisha Purushothaman















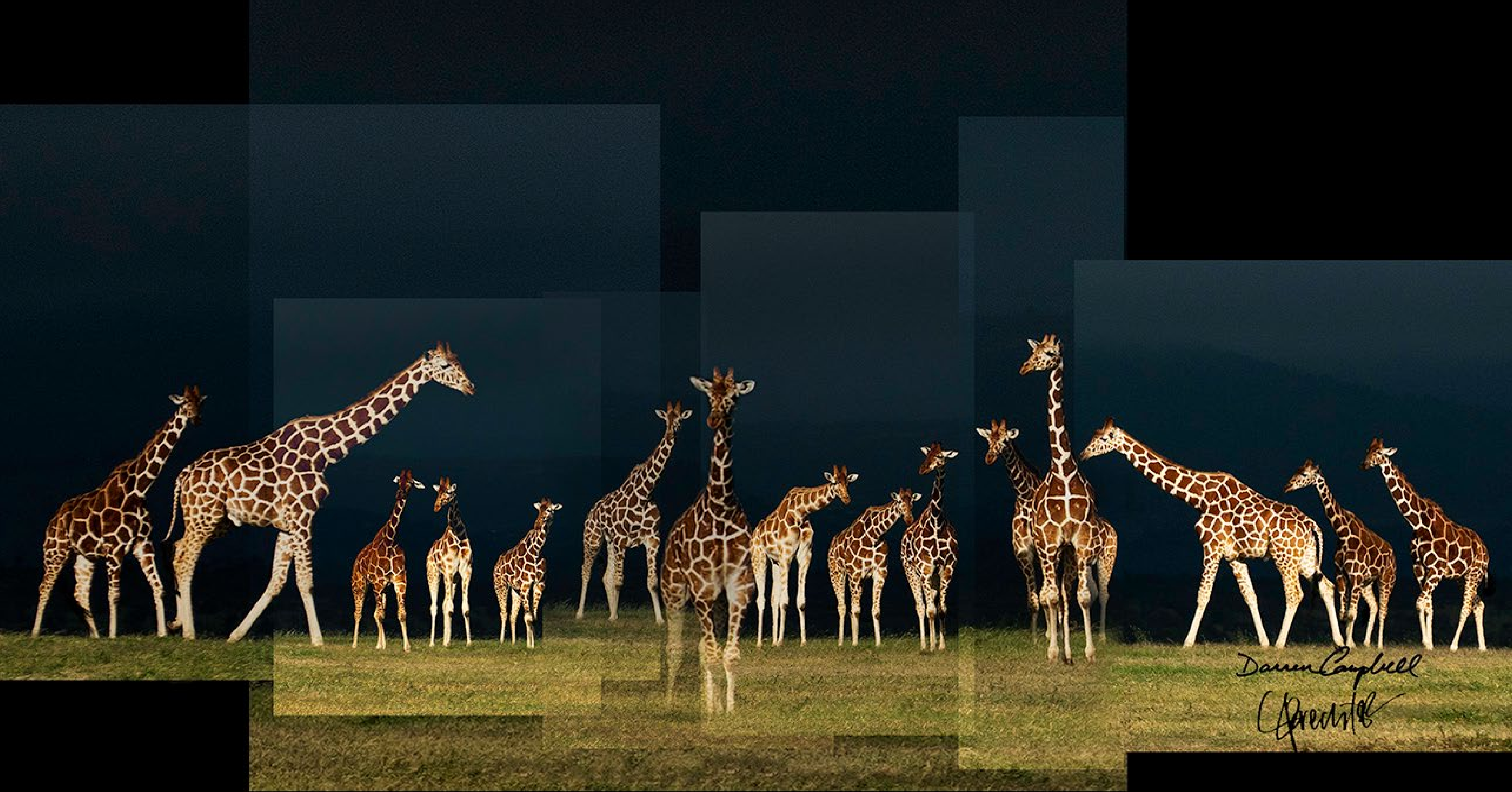












*Darren Campbell
Creative*

P
AWARE
CONSERVATION & PHOTOGRAPHY

UPCOMING EDITION

BENGAL TIGER
C O N S E R V A T I O N

