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AWARE

CONSERVATION & PHOTOGRAPHY
MAR / APR 2021

**Mountain
Gorilla
Habituation
and Covid19**
BY PETER HUDSON

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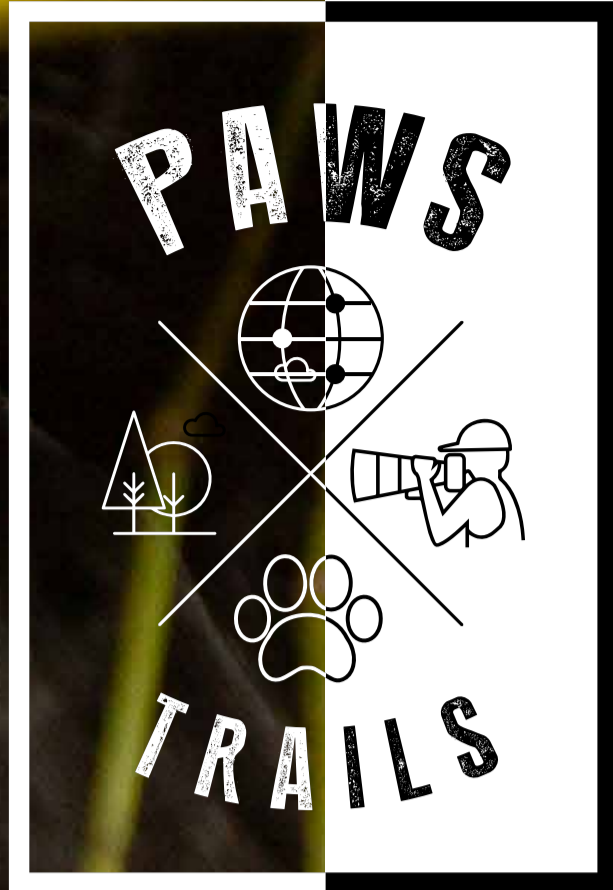
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Raghul Patteri
Editor W

After Chimpanzees and Bonobos, the Gorillas are the closest genetic relative to us. The great African Apes are an indelible link to our shared evolution with them, and the latest DNA research concludes that we not only are related to the great apes, but we are indeed one of them. Humans and Chimpanzees diverged from a common ancestor 8 to 6 million years ago and we belong to the Primates biological group, classified with the great apes.

This edition of PT Aware, Dr. Peter Hudson inspects the fabulous world of the Mountain Gorillas and the different aspects of their conservation with onus on the impacts brought about by habituation to humans and eco-tourism. It is just amazing how Peter finds different angles to peep into the marvelous lives of various species.

It is becoming increasingly necessary these days that conservation efforts take an inclusive view with the human element factored in. The opposite has often led to alienating the local human population with detrimental effects to conservation efforts. In this article Peter talks about the pioneers on Gorilla conservation, the experiments on habituation with humans and its impacts on the health of Gorilla population and the local economy.

Our sincere thanks to the wonderful photographers who have shared the amazing images in this edition. Your images interspaced with the latest nuggets of information from the global scientific community, helps us to tell the story of these awesome species. We pride ourselves on our association with the best from the worlds of photography and science to help spread awareness on the plight of different species from all over the world.

Our next edition will focus on the Hippopotamus, so please prepare to upload your best images of these giants of Africa

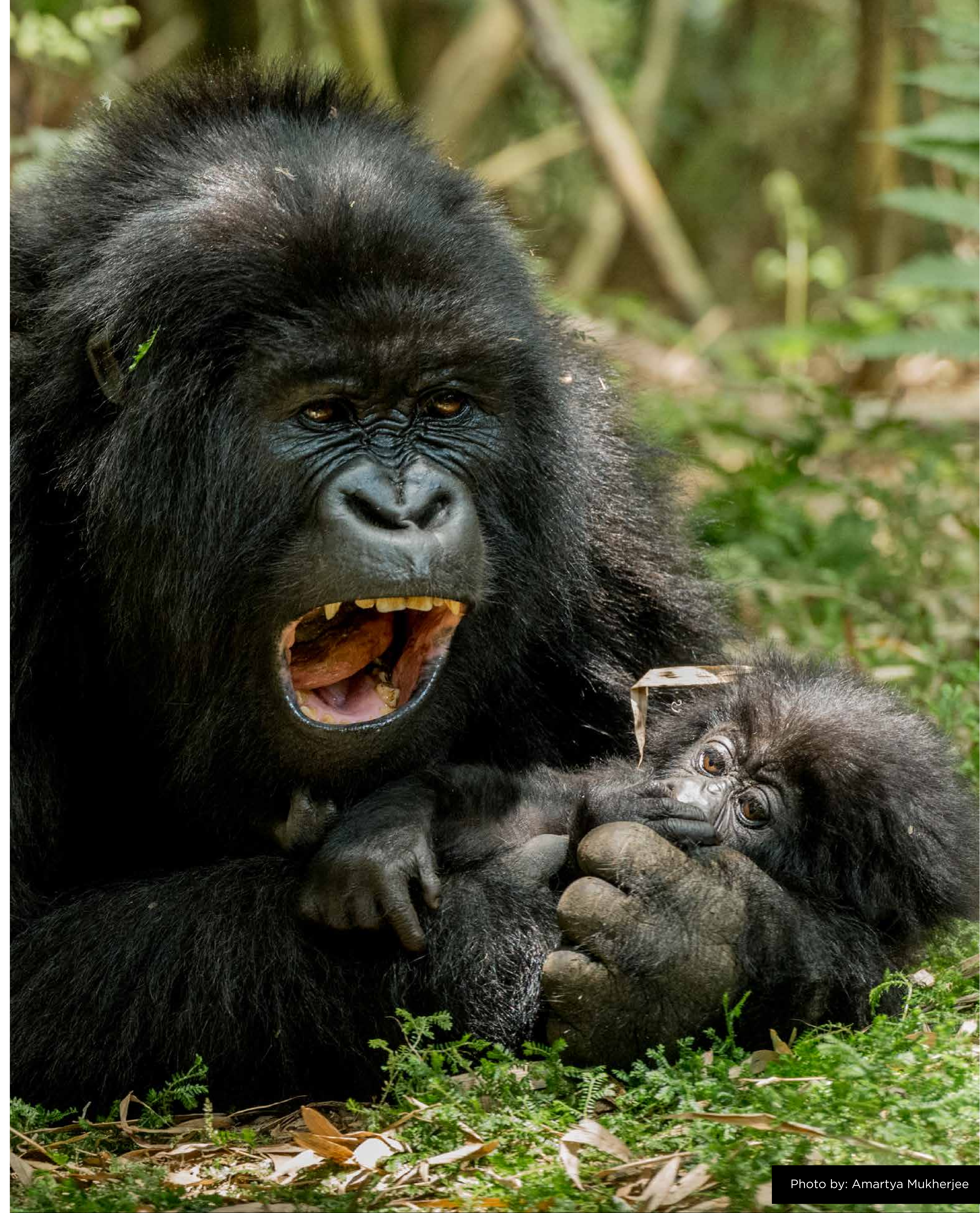


Photo by: Amartya Mukherjee

EDITOR'S DEN

FOUNDERS' NOTE

Welcome to this 'Gorilla' edition of PT Aware.

Mountain Gorillas are not a species that you encounter by chance on a wildlife safari. They are found only in two countries of Africa and a well-planned and expensive expedition specific to Gorillas is needed to sight these close cousins of our race. So, it goes without saying that not everyone will have a Gorilla photograph lying around to share with us. That makes this edition's pictures really special.

It is thanks in part to these wonderful explorers and photographers that we see the upswing in the mountain Gorilla population noted today. The income from eco-tourism has been ploughed back into the considerable expanses necessary for active conservation measures. Other than this the income also benefits local communities with jobs and infrastructure development, creating goodwill for the animals who are bringing the good fortune to the region.

Our salute to all the people who have been to Uganda or Rwanda in search of these great apes, not just for bringing back wonderful images, but also for being important cogs in the conservation machinery.

Stay in touch with Paws Trails through our various social media outreach programs. We are eagerly awaiting the further reduction of Covid19 restrictions to start more of our contact programs and expeditions. Till then we will be reaching you through social media with regular programs. Please check out our various social media handles for details on the same.

pawstrails.com/register
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Hermis Haridas & Nisha Purushothaman

Founders - Paws Trails Explorers



THE STORY

Mountain Gorilla habituation and Covid19

By Peter Hudson,
Conservation Director, Paws Trails

Images by: Usha Harish, Amartya Mukherjee,
Austin Thomas, Joe McDonald and
Peter Hudson





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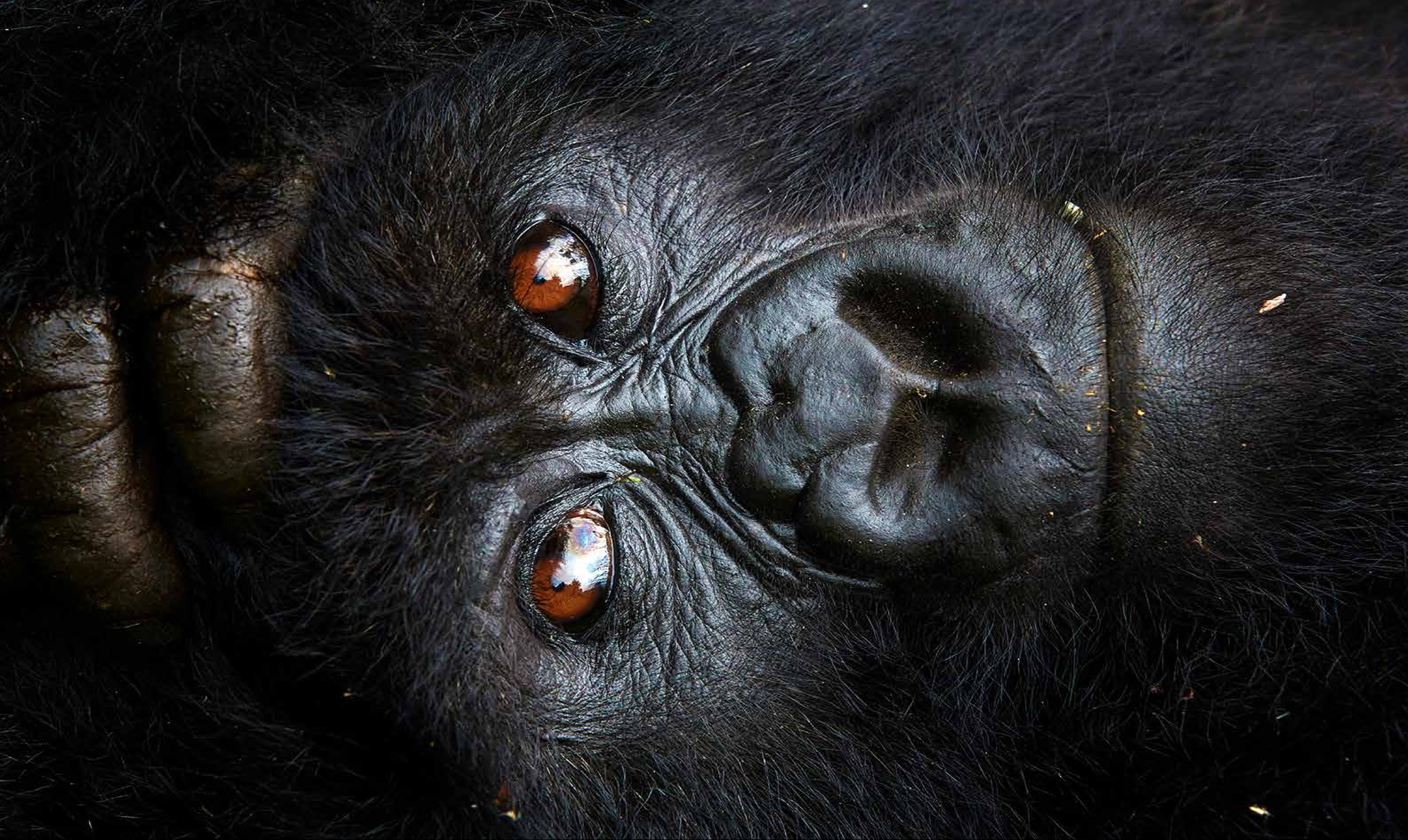
Peter Hudson is a scientist, photographer and conservationist. He undertook his first scientific expedition to Africa at the age of 21 and has been a regular visitor ever since. Passionate about nature, he manages his own 36-hectare nature reserve in Pennsylvania which is home to bears, bobcats and other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

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The recovery of threatened long-lived species is not simple. Partly because it may take several generations before any benefits from management become visible, by which time other factors may also play a role, and partly because of the random events that can occur to small populations. Then again, there have been a number of great successes and one of my favorites is the recovery of Mountain Gorillas (*Gorilla beringei beringei*) that were brought back from the very brink of extinction through active conservation.

In the Virunga mountains during the 70s there were just 250 individual mountain gorillas but then with protection and care the numbers have increased so there are now more than 600 in Virunga with 74% of them are habituated to humans. Further north in the Bwindi Impenetrable Forest in Uganda there are a further 459 gorillas and 50% of these are habituated for tourism and research. The startling thing is the really high percentage of the wild gorilla population that are habituated and receive regular visits from humans and makes me wonder about the benefits and costs of habituation, particularly during the Covid19 pandemic.

The champion who initiated protection and mountain gorilla recovery was the late Dian Fossey. Single-handedly she made the world aware of the plight of these big gentle giants and she fought

hard to stop poaching, removed thousands of snares and stopped people taking young gorillas for zoos. She was actively against any form of ecotourism and thought of them as her gorillas, but since her death in 1989, her habituated mountain gorillas have become the focus of a major ecotourism industry. Within a short drive from the capital of Rwanda you can be in the center of the Virunga mountains and, for the cost of a day ticket, you can spend an hour each day watching these remarkable creatures go about their daily life. Not only is this exceptionally enjoyable but also the funds that ecotourism raise help protect the gorillas and provide important income to Rwanda.

The financial cost of a day ticket is not trivial - one hour with a group of gorillas will cost you \$1500 per person in Rwanda and \$700 in Uganda. There again the money this generates has resulted in significant investment into active conservation, caring for these gorillas and protecting their forest habitat. On top of this is the level of local employment in the hotels and tourism industry and it is clear to the local people how the money flows into the community to provide jobs, schools and health care centers. Indeed, you are made to feel welcome, and the local people are happy to meet and talk to you and of course there are always swarms of young children laughing and playing around you. I was stunned how clean Rwanda is and they have banned

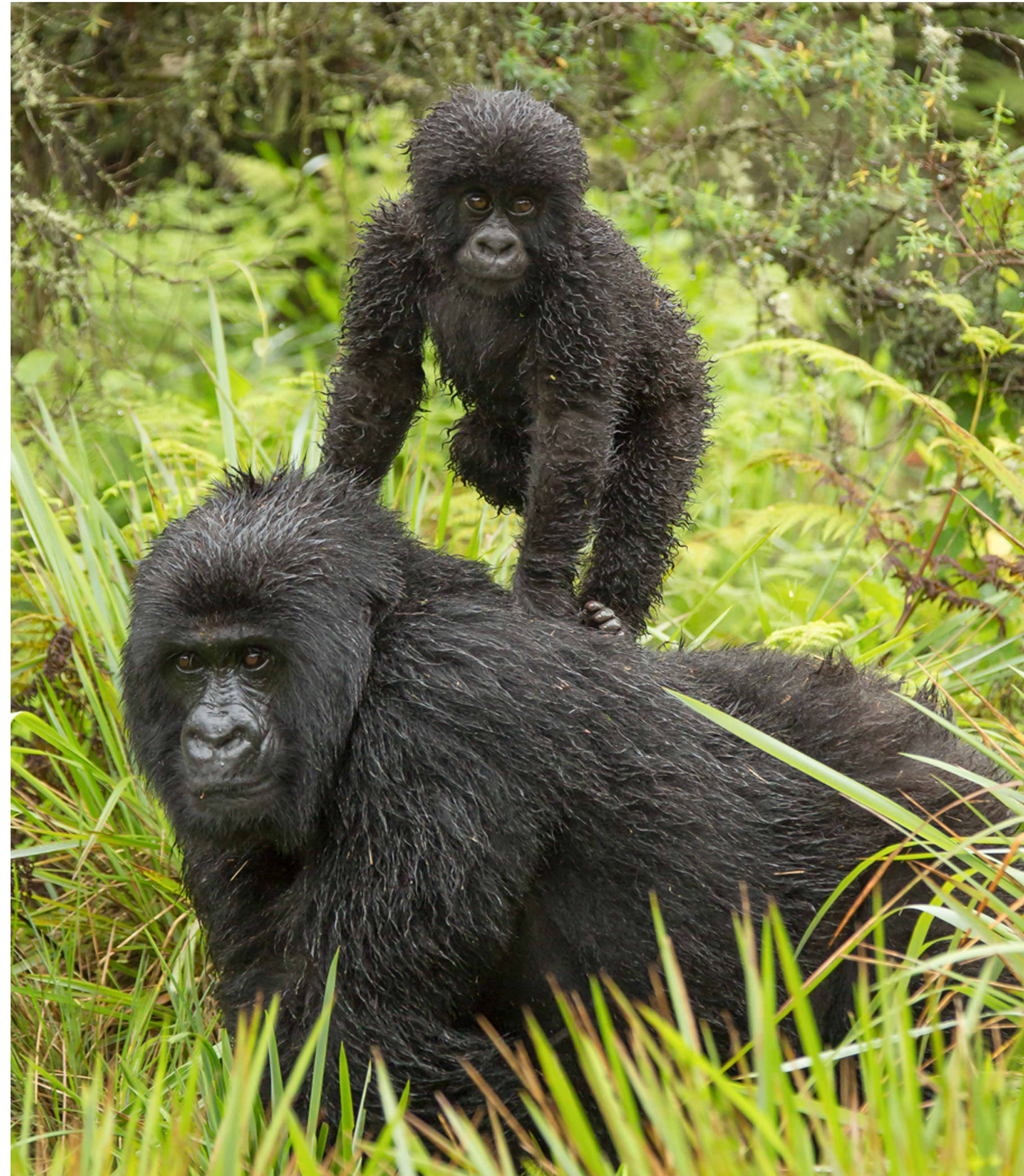


Photo by: Joe McDonald



Photo by: Amartya Mukherjee



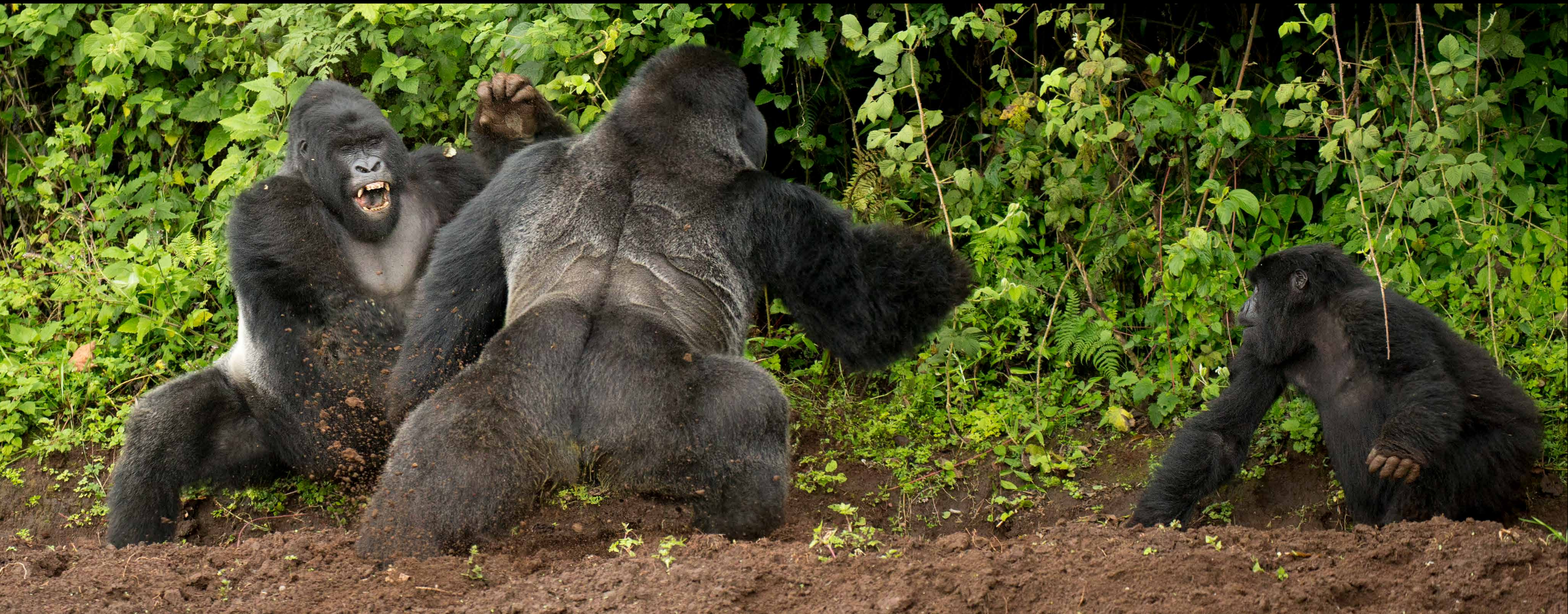


Photo by: Joe McDonald



plastic bags and every month everyone comes out of their house and remove any rubbish. I really enjoyed my time with the charming people of Rwanda.

While mountain gorillas are still listed as Endangered by the IUCN, the two populations have been increasing and doing well as a direct result of conservation efforts, so they are no longer listed as Critically Endangered. In contrast the Western Lowland Gorilla (*Gorilla gorilla gorilla*) is in a much worse situation with a declining population and are still classified as Critically Endangered.

There is no question, the mountain gorilla is an awe-inspiring creature, a male gorilla can weigh up to 220kg (485lbs) and can be up to six foot tall (2 meters). I must say some of my most enjoyable natural history times have included sitting and watching a mother lovingly interact with her baby, watching the power and strength of a large male as he casually pulls down bamboo and the way the gorillas both ignore you and subtly communicate with their young. They accept your presence, telling the young ones to be relaxed and also telling them not to go too close. Truly a highlight in a lifetime spent watching wildlife.

Habituation and Current status

With all primates, and indeed most mammals, it is possible to slowly and carefully get specific groups habituated to the presence of







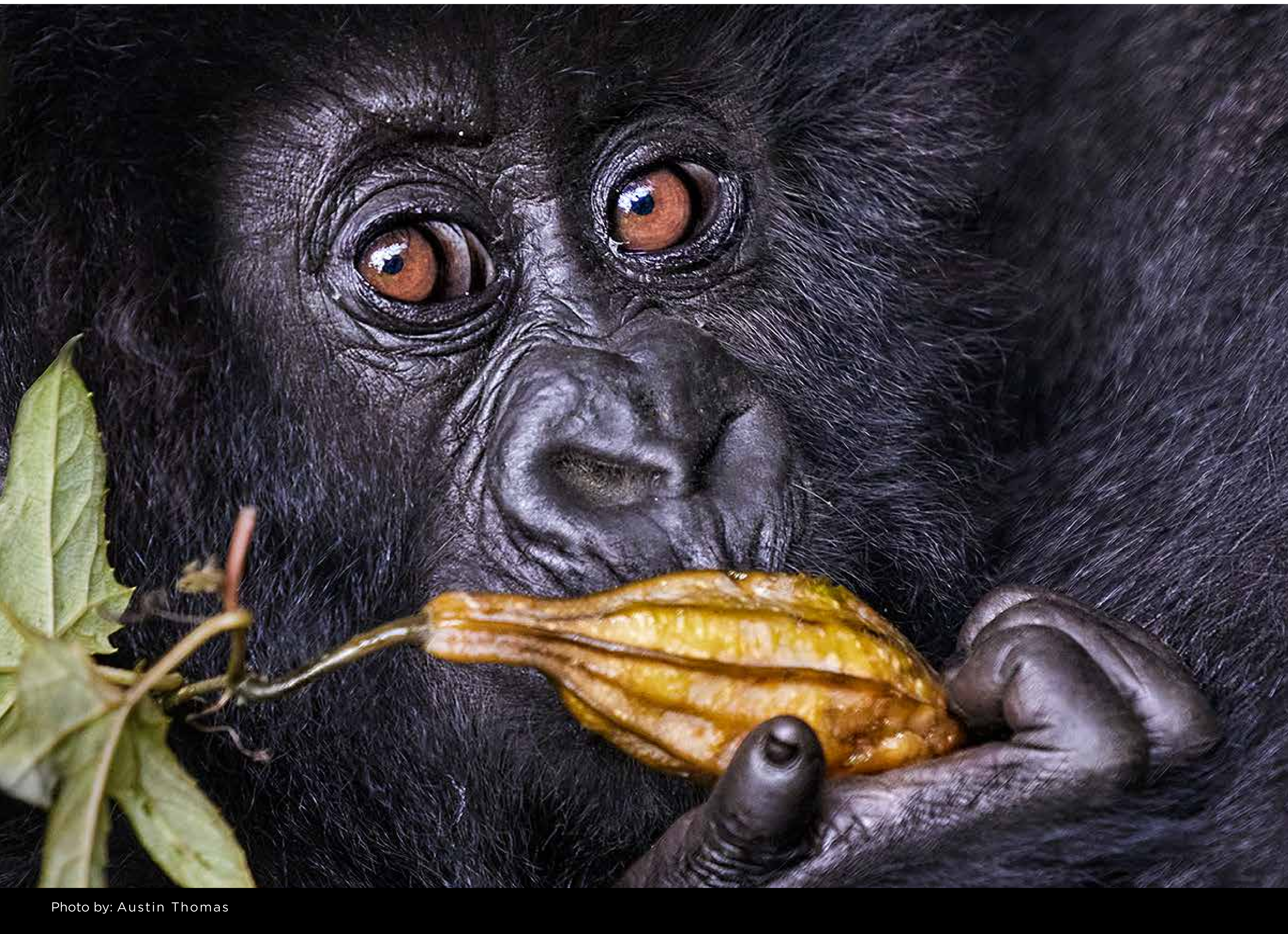


Photo by: Austin Thomas

humans. This is a labor intensive and a careful procedure involving hundreds of hours in the field, sitting quietly and acting nonchalant and unthreatening. The trick is to first establish that you can be within sight of the group and not scare them off and then to slowly reduce the flight distance, so the animals tolerate your presence and then come to accept that you are no threat. In her book "*In the Shadow of Man*" Jane Goodall describes in detail how she would climb a hill at some distance from a fruiting tree and sit quietly and hope the Chimpanzees (*Pan troglodytes*) would approach the tree and then, bit by bit accept her presence. Dian Fossey visited Goodall on her way to Virunga and I suspect got advice about habituation and, in her book "*Gorillas in the Mist*", she describes how she found that mimicking their actions, making grunting sounds and submissive behavior while eating celery plants resulted in the gorillas accepting her. Earlier in life she had worked as an occupational therapist with autistic children, and she claimed this experience helped her win the acceptance of the gorillas. In primate research, the first step is to get the groups habituated and the next is to recognize individuals so you can observe who interacts with whom and build up a timeline of events from known individuals. Fossey used the techniques developed by George Schaller where she would identify each individual from their nose prints - like human fingerprints



Photo by: Peter Hudson





Photo by: Austin Thomas

or the whisker prints of lions, every nose of a gorilla is shaped in a unique way so that you can distinguish between individuals.

Care and response of habituated groups

In the management of wild animal populations, it is very important to know how many animals you have, where they are and what actions should be taken to care for them. With the majority of mountain gorillas in habituated groups I want to examine now how well the habituated groups fare in comparison to the free ranging groups.

Of course, if you want to compare habituated with unhabituated groups the real problem is gathering the comparative information from the unhabituated groups. This is not easy since these groups are wary of people and inhabit dense vegetation, so it is not possible to conduct a count from a distance or a plane. Researchers have collected information on these unhabituated groups by recording the location and number of night nests. Each night when gorillas go to bed, each gorilla over the age of four makes their own nest where they bend branches down and bring grass together to make a sleeping nest. These are usually on the ground, but the juveniles and some mothers make them in trees. Since the babies sleep with their mother until a new baby comes along, counting these nests provides an estimate of the size of the group. The limitations are that you assume that you find all the gorilla nests and that gorillas make just one nest and then if you find two sites nearby, are they separate groups or the same group? A statistical solution would be to follow multiple habituated groups, count their nests and so get an estimate of the error in counting the nests and this can be applied as a correction factor. A better solution is to use a secondary technique that would

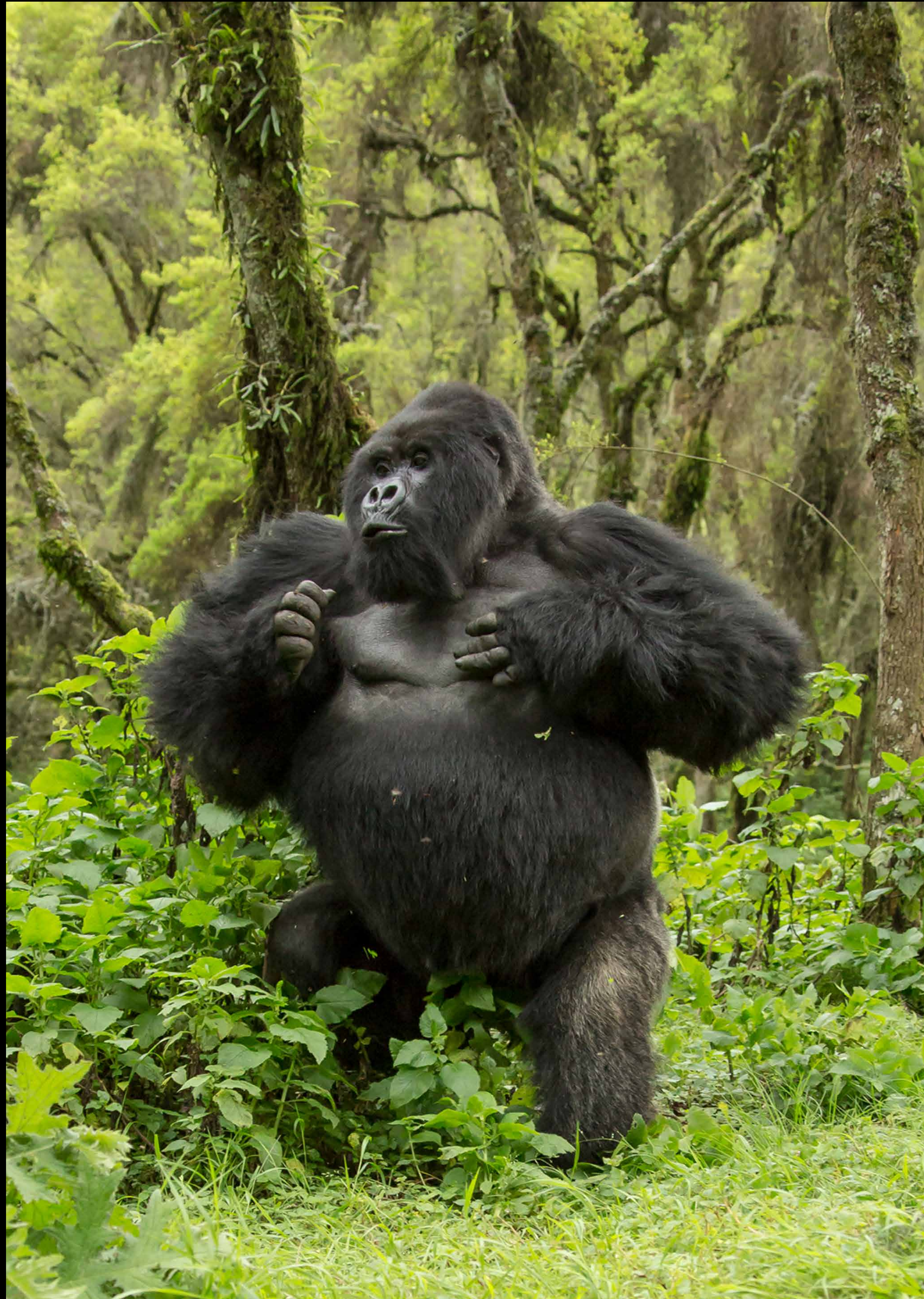


Photo by: Joe McDonald



Photo by: Joe McDonald





allow you to get an independent estimate. Techniques have now been developed to extract the DNA from the poop of individual gorillas. This allows us to work out which poop samples came from which individuals, work out the number of individuals within the group and also to determine sex and potentially relatedness between the individuals.

Using DNA techniques and estimating group size over time was revealing since it provided evidence to suppose that habituated groups grew 5 times faster than the unhabituated groups. That is a huge difference and if true shows that results of habituation are impressive. Of course, there may be limitations here, first being whether this was a true effect and not the result of inaccuracies in the census methods or random demographic effects versus better conditions for the habituated gorillas. The habituated groups are in the central part of the mountains and in the thickest and probably the best habitat so they may be doing better quite simply because of their location and the difference may have nothing to do with habituation. On the other hand, the habituated groups receive daily veterinary care and if there are any signs of disease or injury then care can be administered by the Gorilla Doctors immediately.

Gorilla Doctors

Dian Fossey was very concerned about the snares that were placed in the forests, often to catch game but

were inadvertently getting caught around the limbs of gorillas, causing infections. She raised funds to hire James Foster in 1986 to be the first Gorilla Doctor who had the skills to anesthetize gorillas, remove snares and treat wounds and treat some infections.

The health check on the gorillas has now risen to the next level and the trackers record the health of the gorillas daily into a system called IMPACT: Internet Management Program to Assist Conservation Technologies. Trackers record details about location, gorilla group membership and the health of each individual. Indeed, there are now tens of thousands of records that provide an in-depth understanding of the health trends in the population as well as a clearer picture of the overall health of each individual gorilla over time. When a gorilla is found to be suffering from a human-induced or life-threatening injury the veterinary team works with the national park authorities and make plans for intervention. This may be the removal of a snare or treatment of a respiratory infection and there is no question that this health care has helped the habituated gorillas. If you are interested check out the website showing the vets in action treating gorillas at gorilladoctors.org.

Covid19 and other respiratory infections

Over the past year we have all learnt so much more about respiratory disease and the



Photo by: Peter Hudson



Photo by: Joe McDonald

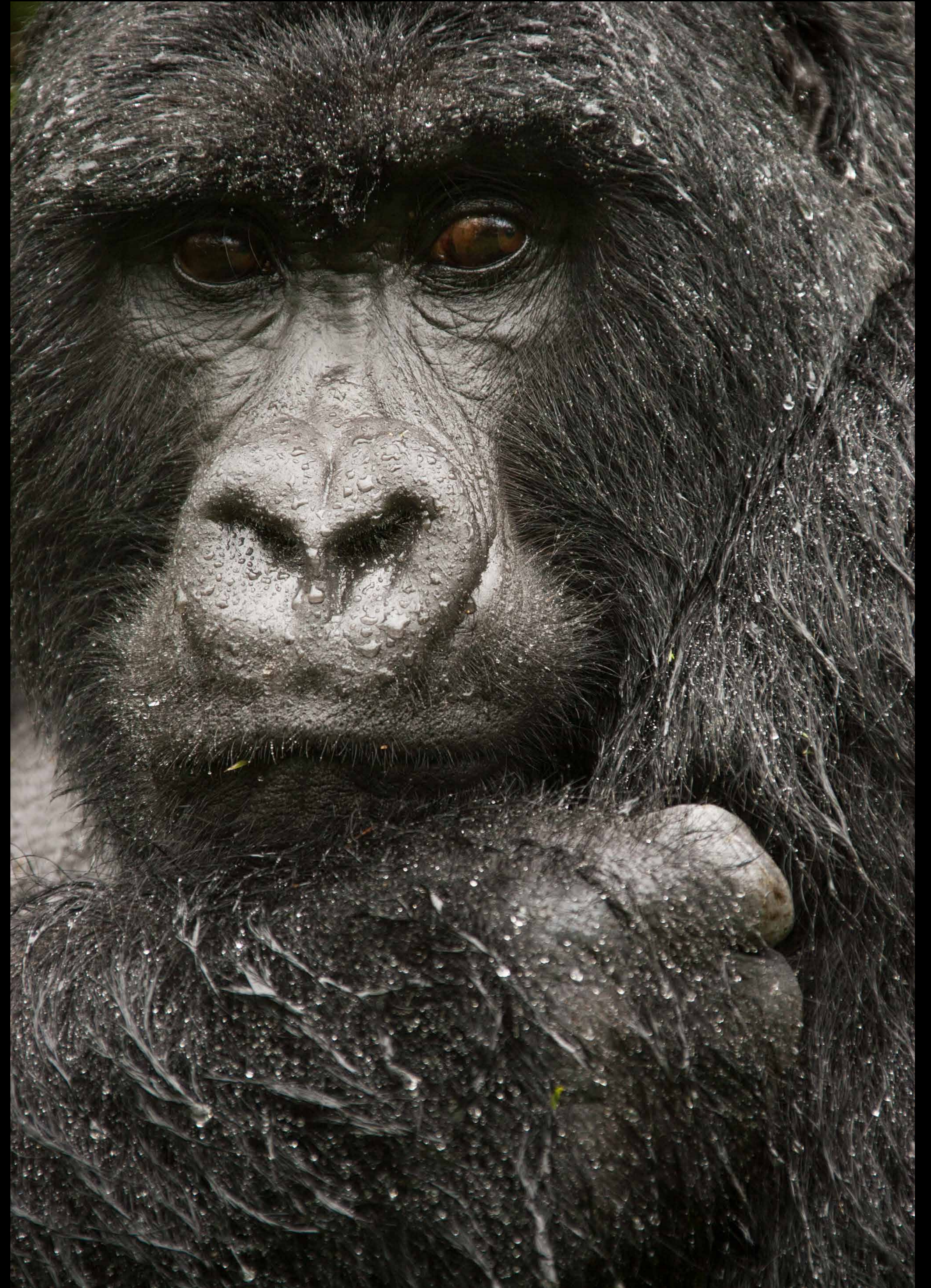


Photo by: Joe McDonald

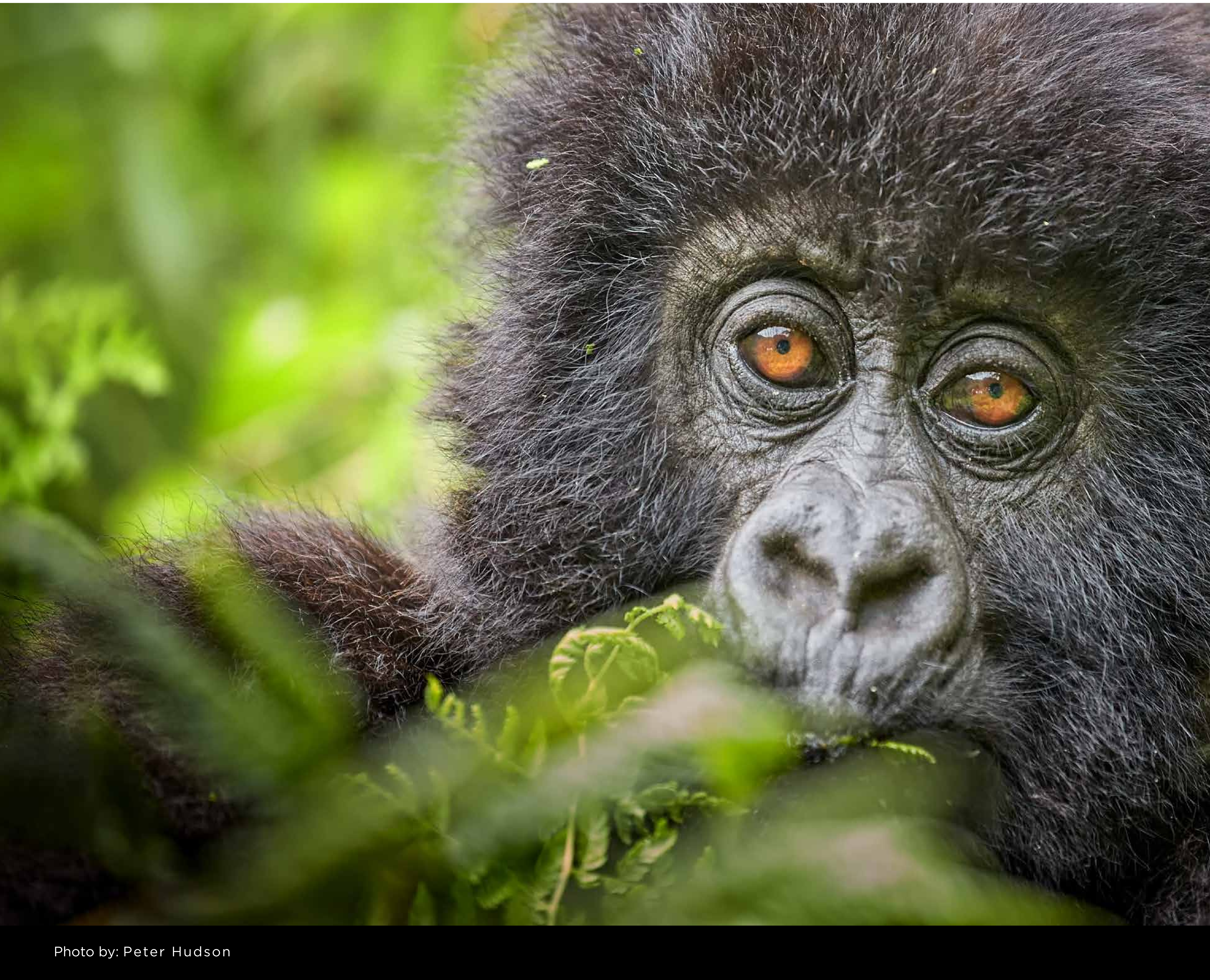


Photo by: Peter Hudson

need for social distancing to prevent exposure to infection. As close relatives of ours, gorillas have many of the characteristics that make both us and them susceptible to the same infections. Gorillas are vulnerable to a wide range of human infections including gastro-intestinal infections and external parasites, but the biggest threat is thought to be from respiratory infections and that an infected tourist coming into close proximity of a gorilla can pass on the infection just through a sneeze. The primary concern is direct transmission through a sneeze but there is also the possibility of a transmission from hand to branch or from someone urinating or spitting within the vicinity of the animals. I remember well a measles outbreak in the late 1980s when 6 mountain gorillas died in Rwanda. In 2016 there was an outbreak of a human respiratory illness in chimps in Uganda's Kibale National Park that killed 25 chimps and infected 44 percent of the population's 205 members. Gorillas share with humans the membrane protein ACE2 that allows the virus to bind and infect cells and recently three lowland gorillas at San Diego Zoo Safari Park tested positive for Covid19 in January, the first reported cases of Covid19 in any non-human primate. While the animals recovered with medical intervention there is concern that Covid19 could spread from tourists or trackers into the wild gorilla population and wipe out multiple gorilla groups and even threaten the species.

The IUCN has published guidelines for great ape tourism and recommend keeping a distance of at least 23 feet (seven meters) from the animals and wearing face masks. Uganda, Rwanda, and DRC all had adopted the seven-meter rule before the pandemic although only DRC have required face masks. Since the Covid19 pandemic, most people appreciate the importance of wearing masks and maintaining a suitable distance to prevent exposure. A study undertaken a few years ago in Uganda recorded in detail the actual distance between gorillas and tourists and showed that people were consistently much less than the 7 meters from the gorillas and this



was not simply because of fleeting chance encounters when a gorilla walked towards people. Similarly, a more recent study examined selfies of people that were posted on Instagram and had used gorilla trekking hashtags and showed most people standing close to gorillas simply to get the photo. On the one hand this is worrying for disease transmission, in particular during a human respiratory pandemic. On the other hand, I know from experience that it is often not easy to see the gorillas through the dense vegetation and the trackers were very good in positioning our group so you can watch while keeping an acceptable distance. When approached by juveniles it does not feel right to turn your back and run and even then, you can be caught with dense vegetation or other tourists close behind you and the trackers were very good at warning the gorillas with verbal grunts not to come closer.

Closing comments

Habituation of mountain gorilla groups has been beneficial for the recovery of the gorillas, making them a valuable commodity for the country and generating income for the local people. With protection of their habitat, the removal of snares and the veterinary intervention the populations have responded remarkably well. I think it would be somewhat unwise to habituate all the groups, after all if an infection were to break out in one or two of

the habituated groups, we would hope it would not pass to many of the unhabituated groups. Success in conservation invariably comes by spreading the risk, such that one calamitous event would not result in the loss of a whole population or even the species.

Controlling infections is all about prevention – prevent exposure with masks and hand washing, coupled with careful behavior. I suspect the authorities are looking hard at the conditions for tourists visiting the gorillas and I think it would be sensible to consider a 24-hour quarantine period in a hotel before approaching the gorillas during which time the health of the tourists could be examined and samples taken to test for infections. There are now multiple means by which a range of potential infections could be tested relatively fast. Having said that, it would be easier and less costly to request that everyone visiting the gorillas brings proof of vaccination or a serology test that shows presence of antibodies and thus protection against a range of respiratory infections including influenza, Covid19, measles etc. There is also the ethical question of whether we should consider vaccinating the gorillas against infection. Undertaking this would not be too difficult since the Gorilla Doctors regularly inject antibiotics with a dart into specific individuals when they show signs of a bacterial infection.

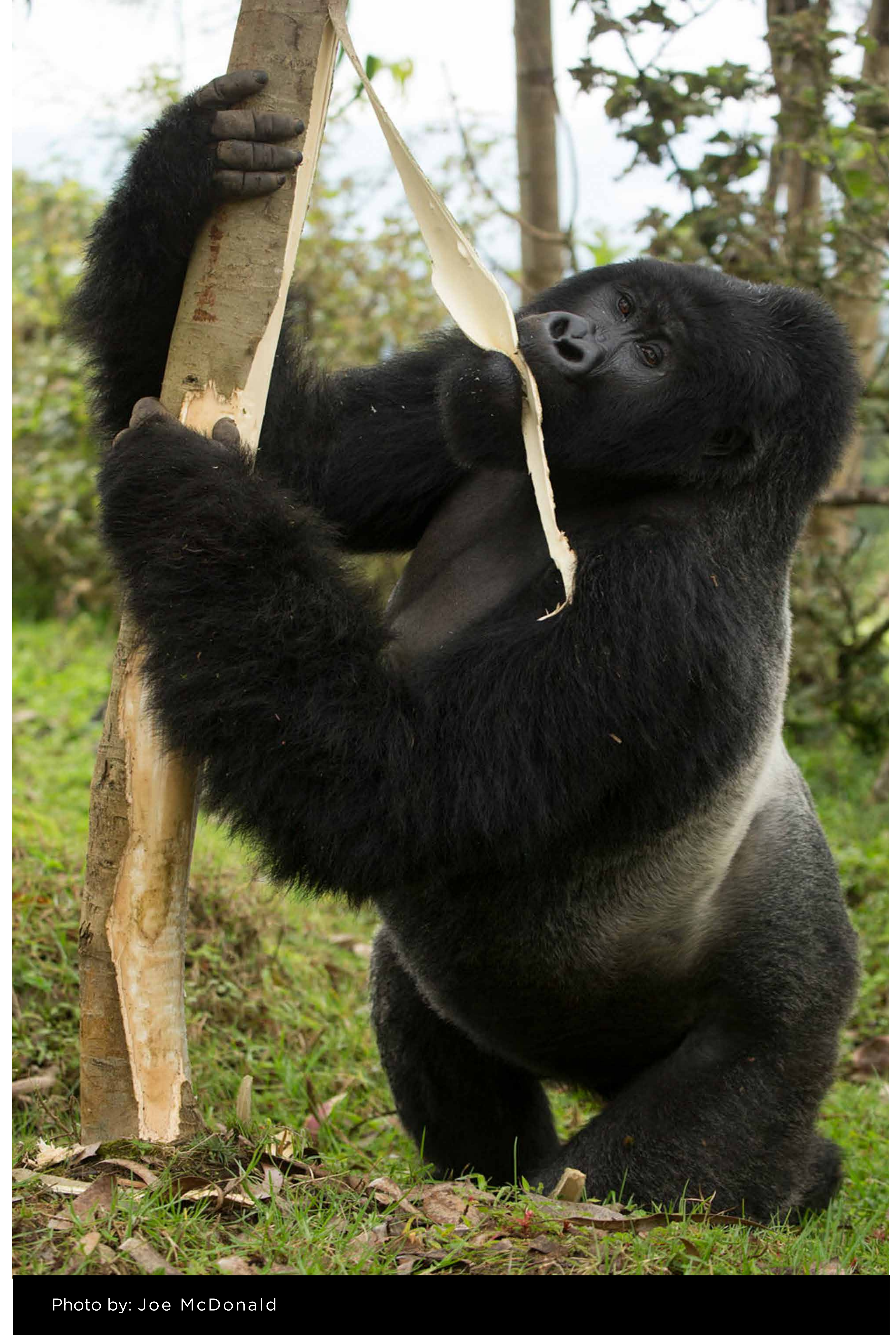


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