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JAN / FEB 2022



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**The Dik-dik :  
Territorial defence  
in a small antelope**  
By Peter Hudson  
with Mary Fick

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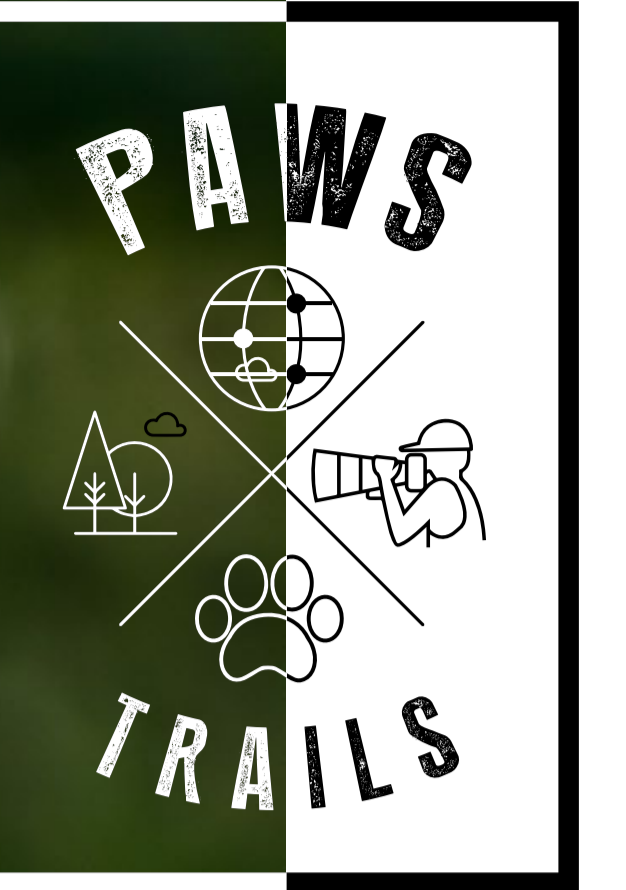
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Raghul Patteri  
Editor

This edition is our first publication for the year 2022. Wish you all a very Happy New Year!

There are times when atleast some of us would have felt overshadowed by the presence of a more illustrious cousin or a neighbour. That is the situation that the Dik-dik finds itself in on the African savannah. The more charismatic or larger animals of Africa needs no introduction, but there would be very few humans who even know that there is a small antelope called the Dik-dik that lives amongst them.

That is one of the reasons for chronicling the Dik-dik in this edition, a reminder to everyone that this planet is full of intriguing and beautiful life. Yet another example of nature's ingenuity, this antelope has evolved its biology to suit the habitat and avoid predators.

Read about the amazing lives and biology of the Dik-dik in Dr. Peter Hudson's interesting narrative. Thanks to his considerable experience in studying wildlife and also of photographing them, Peter is not just able to talk about the animal, but also able to provide the best tips on photographing them.

In this edition, he explains the best areas and best time of the day for photographing the Dik-dik.

The global PawsTrails community never ceases to surprise us. Even though we were not chronicling a charismatic or large species this time, our photographer friends came up trumps and provided the brilliant photographs that you will enjoy in this edition.

Thanks to each of you for helping to bring the Dik-dik into the limelight. At PawsTrails, our associations with Photographers, scientists and conservationists help us bring the best stories from the animal world to our readers.

The next edition will focus on the Secretarybird, so please keep your Secretarybird images ready.



Photo by: Lamak Sheikh

**EDITOR'S DEN**

# FOUNDERS' NOTE

Welcome to our first edition for the year 2022.

The year 2021 was a momentous one, the highlight being the world coming out of the covid pandemic and the easing of travel restrictions. At PawsTrails, one of our cherished dreams came true with the opening of the Mara Trails lodge. We finally have our very own lodge in the Maasai Mara, a place we wish to utilize for bringing people closer to nature and to help the local communities who are the actual guardians of the wildlife.

But the year 2021 was not all about achievements, it was another year that showed us the demons that come with the reality of climate change. Wildfires across California and Europe served as a rude reminder that climate change is real and that we are already late to act. To make matters worse, when we thought the worst of the covid pandemic was over, we now appear to be staring at the start of another wave.

We urge the global PawsTrails community to renew your pledge for the betterment of mother earth. Let the change start with you. Reuse and recycle, use sustainably made products, reduce your carbon footprint, avoid single-use plastics - please make the change happen. Let us be positive forces in the war against climate change, let us fight together...

**Hermis Haridas & Nisha Purushothaman**

Founders - Paws Trails Explorers





THE STORY

# The Dik-dik Territorial defence in a small antelope

By Peter Hudson  
Conservation Director, Paws Trails

with Mary Fick,

Images by: Peter Hudson, Hermis Haridas, Silke Hullmann, Kalika Shah, Vivek Sunder, Sinoop Keloth, Andrea Castelli, Lamak Sheikh, Tilak Raj, Trushal Kerai, Shreya Patel, Silvia Ribeiro, Melissa McCeney, Kamalak Kannan Bownaan, Deepa Girish, and Amartya Mukherjee



Canon  
IMAGING PARTNER

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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. For the past 11 years he has been working on how and why viruses move from bats to humans in an attempt to predict when viral spillover occurs. He has also been studying the wolves in Yellowstone, tortoises in the Mojave Desert and bighorn sheep in Idaho.

**Peter is the Conservation Director at Paws Trails and uses his skills as a scientist and educator to increase awareness about conservation issues. He is supported by two interns at Paws Trails: Hayden Kissel and Shreya Menon. He is also heavily involved with the Random Good Foundation that undertakes story telling for social change. 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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Photo by: Ali Alhajri





There is a wonderful African folk tale that gives insight into the biology and life of the Dik-dik. One day Juma, the king of all the Dik-diks, was out walking through his kingdom when he inadvertently tripped over and fell into a huge pile of steaming elephant dung. He was understandably furious, so he called a meeting of all the Dik-diks of the land at which he said the Dik-diks were to take revenge on the elephant. He told them that while Dik-diks were small, together they can be big and henceforth the Dik-diks were all to defecate in the same place and produce a dung heap so big that it would trip up a passing elephant so that justice could be served.

#### **Dik-diks toilet behaviour**

As with so many of these African folklore stories, there is a modicum of truth that arises from careful observations of the animals. Dik-diks do indeed produce piles of dung, in latrines that several Dik-diks will defecate on, although the evidence looks as though it relates more to territorial defence than to seeking revenge on elephants. There is also something of a ritual that takes place when a family group of Dik-diks approach a latrine. The female, who doesn't have horns but is bigger than the male, approaches the latrine first, urinates in a characteristic hunched position and then accentuates this hunched position when she defecates.

Next, the fawn walks onto the

midden to defaecate and last, the male approaches the dung pile, smells the dung of the female and scratches it backwards as he urinates on it, and then he does a 180° turn and urinates again. He makes a few more turns and defecates before doing one final 180° pirouette and completes his ritualized dunging behavior. After this, both the male and female go to a nearby bush or piece of grass and open their preorbital gland to deposit a pea sized extract onto the bush.

This pre-orbital gland is the obvious opening just in front of the eye and while marking, looks as though the antelope is poking its own eye out with a stick. Many antelope species use latrines to communicate their presence, although, in most species, only the males use the latrines so for females and fawns to utilize them is intriguing. Some workers have suggested that the characteristic hunched position when defaecating is also a ritualized visual signal that reinforces the scent marking to their neighbours. There can be as many as 20 dung piles within one territory and Dik-diks from both neighbouring territories will use the same latrine to confirm that this is the edge of a territory. While neighboring Dik-diks will chase each other it is exceedingly rare for them to ever make contact and fight. Interestingly, there is often an old midden close by the active one and I wonder if they abandon middens when they lose a mate, or the territory is taken over by new individuals.



Photo by: Tilak Raj





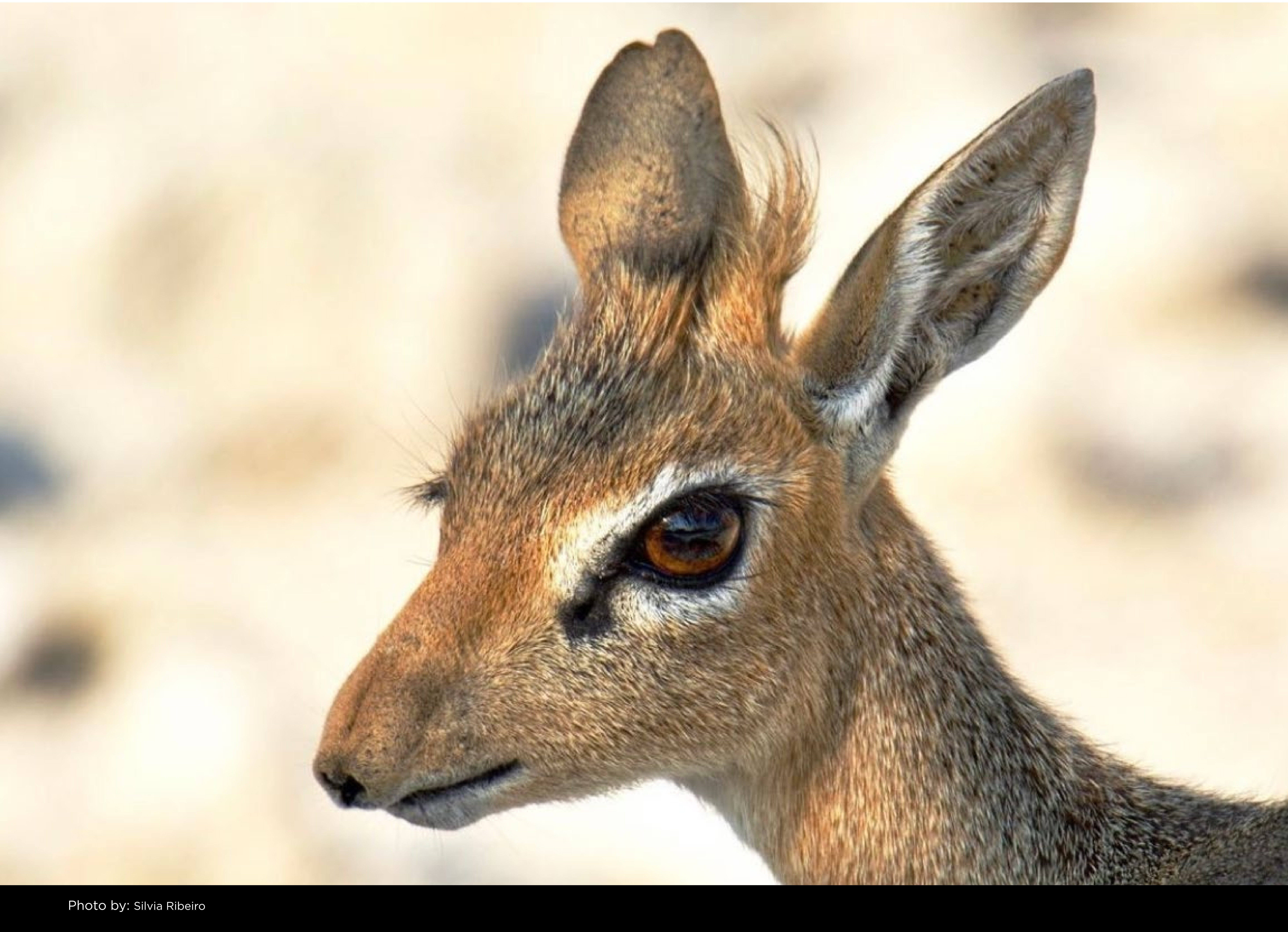


Photo by: Silvia Ribeiro

### **Latrines, territories, and predator avoidance**

As a very small antelope, Dik-diks are vulnerable prey to any passing predator and are taken by more than 20 predator species: lions, cheetahs, leopards, African wild dogs, martial eagles, jackals, caracals, servals, pythons and more. Without question, the selective pressure on these animals to avoid predation is massive and their *modus operandi* is to know a section of bush so well that with every twist and turn they can spot a predator coming from a distance, hide and move around the vegetation to avoid them. They know their area so well that they can dodge any predator attack and will not try to outrun them but dive into a hiding spot, so the predator misses them. In the meantime, they can't be out grazing for hours at a time leaving themselves exposed to all the passing predators, so they are specialized browsers taking just the highly nutritious leaves and buds from the trees and shrubs they feed on, mostly in the evening and before midnight but also in the early morning, when is the perfect time to photograph them. Compared to other antelope species, they spend an inordinately long time either ruminating or simply hiding from predators.

In my experience the best places to see Dik-diks are close to the safari camps. Ndotu safari camp in the south of the Serengeti is a case in point. Situated in the arid scrub, every time you turn around you see a pair of Dik-diks. Initially I thought this could be simply because the habitat was perfect, and the predators avoided the camps - but



Photo by: Peter Hudson





Photo by: Amartya Mukherjee

this was not really true since I bumped into a lion one night. Maybe reduced predator pressure coupled with nocturnal lighting that allows them the means to browse more at night, and some access to water may be driving this preference.

### **Young production**

One benefit of the highly nutritious food is that the females produce 2 fawns a year, but only ever one at a time – yet another form of predator avoidance I wonder? They produce these fawns so fast that they are lactating with one fawn while pregnant with the next. Like most antelopes, she leaves the fawn “lying out” and visits it for periods of about 10 minutes to feed, four or five times a day. As the fawn gets larger, she takes it to a new hiding place every day and by the time the fawn is 6 months of age, the fawn spends most of its time with the male while the female is caring for the next offspring. At this age, the parents start to push the young off to find their own territory and no doubt this is a period of heavy mortality before they establish and get to know their own territory.

### **Water retention and the strange nose**

Dik-diks inhabit semi-arid areas where access to water is difficult and should they get to a waterhole draws the undesired attention of predators. This is even more an issue for such a small antelope that has a high surface area to body mass ratio and so heats up fast and loses water much faster than a larger species. The Dik-dik exhibits





several amazing adaptations. Many of these are subtle like adaptations in kidneys that can reabsorb urea, passing highly concentrated urine, water absorption physiology and reduced density of sweat glands compared to cattle, but similar to that seen in camels.

Perhaps the most obvious adaptation is their remarkable flexible nose or proboscis which is similar in structure to the remarkable noses of the unrelated tapir and saiga. The nose is lined with multiple blood vessels where the blood is cooled through evaporation of water from the mucosal membrane, a very economical method when water loss is a critical issue. They even lick the condensation that appears on the end of the nose to help water retention. The cool blood circulates to a sinus where it cools the blood destined for the brain and keeps the brain sharp and active. Cooling can be increased through panting behaviour where the flexible nose acts as a bellows and water loss is prevented through fine hairs and small nostrils.

### Conservation and Conclusion

The Dik-diks are a group of four very similar looking species restricted to the arid regions of Africa and only one species, the Silver Dik-dik, restricted to Somalia, is decreasing and of concern although we lack knowledge. The three other species are not threatened and are stable although the continual loss of habitat must mean numbers are falling. The

species we have focused on here is primarily Kirk's Dik-dik (*Madoqua guentheri*) since this species is the prevalent species in East Africa and the one photographed the most by our readers. Interestingly this species has a really disjunct distribution with a large population in East Africa, (southern Kenya and Tanzania) and another in northern Namibia and western Angola. The explanation is that once they were all one population, but increased humidity and development of more humid forests split the population. Another common species, that looks very much like Kirk's Dik-dik, is Guenther's Dik-dik (*Madoqua guentheri*), found in Northern Kenya and up through Ethiopia, Somalia, and South Sudan. The final species is Salt's Dik-dik (*Madoqua saltiana*) that occurs to the east of Guenther's in Somalia and up through Ethiopia to Eritrea.

The Dik-diks are doing well amongst the antelope species where 25% of the species are threatened and 62% are declining. The antelopes of arid and desert areas appear also to be the most vulnerable now, so we hope this detailed look at the Dik-dik does two things. First, draws your attention away from the large and charismatic species of the African bush to appreciate the subtleties and beauty of the less obvious small antelopes. Second, to provide you with biological insight and understanding that you can apply in your photography to reveal stories about these and other antelope species.



Photo by: Kalika Shah







Photo by: Sinoop Keloth



Photo by: Melissa McCeney

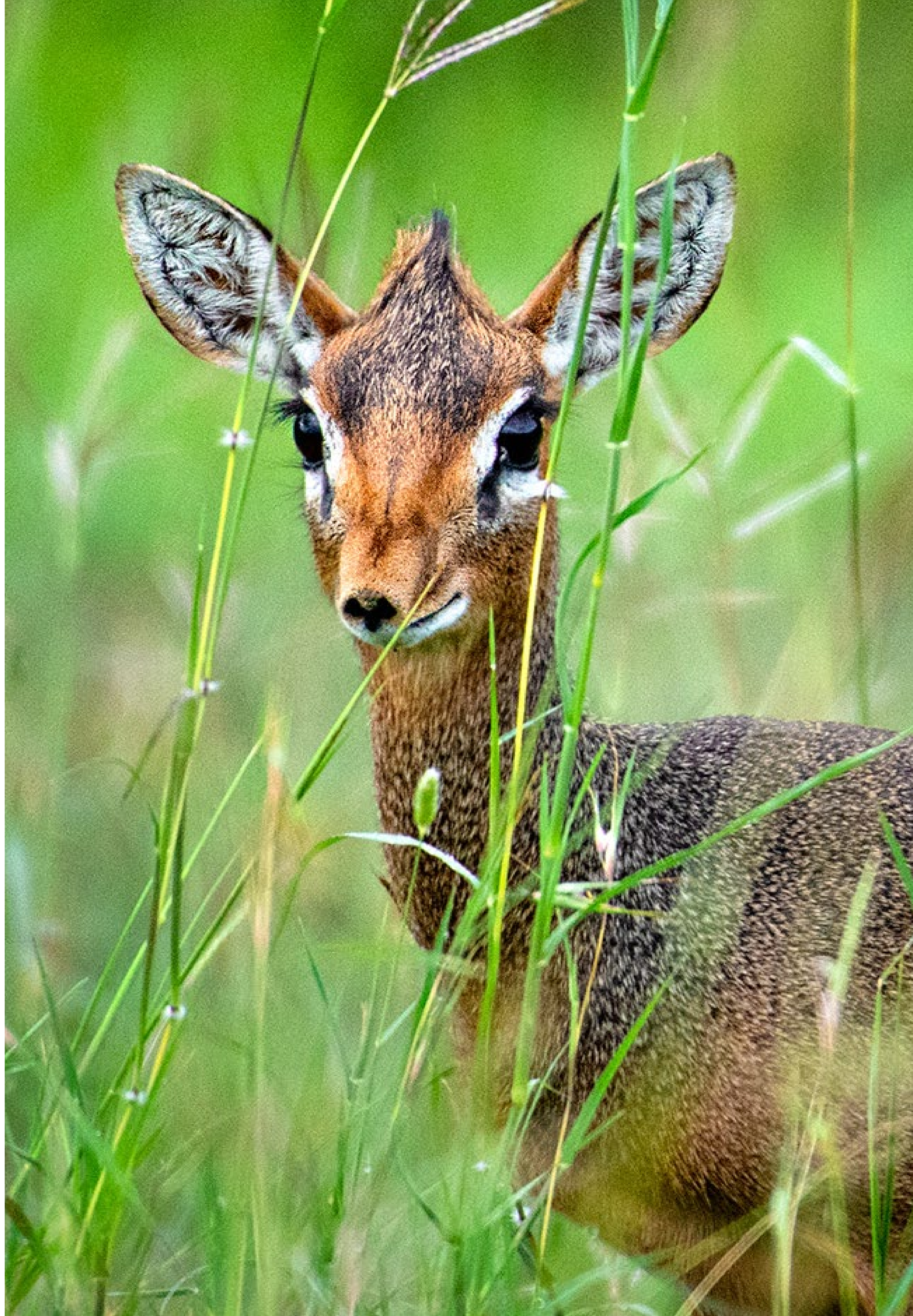


Photo by: Sinoop Keloth











Photo by: Silvia Ribeiro



Photo by: Shreya Patel







Silke Hullmann  
PHOTOGRAPHY

Photo by: Silke Hullmann



Photo by: Peter Hudson









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UPCOMING EDITION

**SECRETARY BIRD**

