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LILAC-BREASTED ROLLER

By Peter Hudson
with Mary Fick

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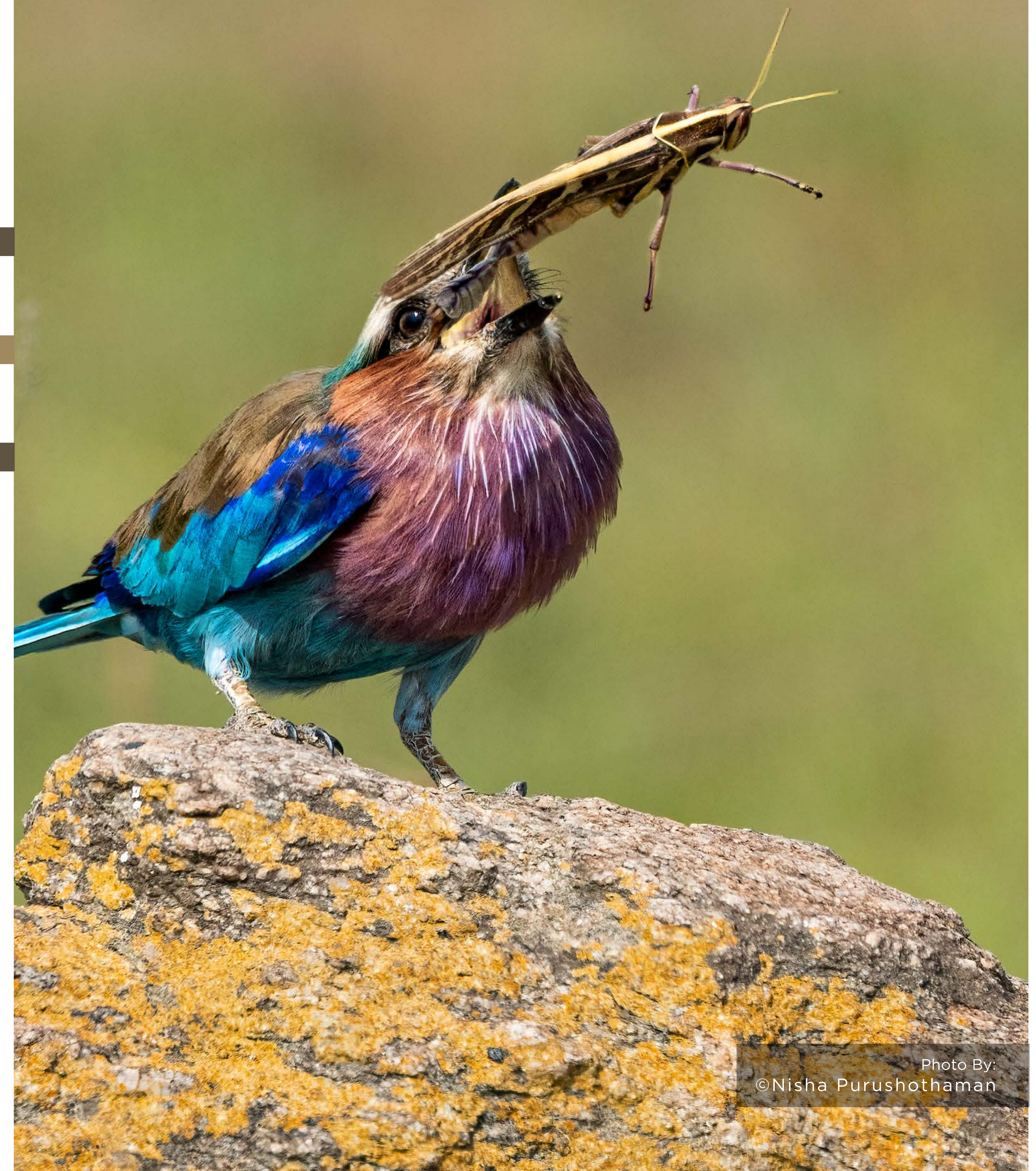
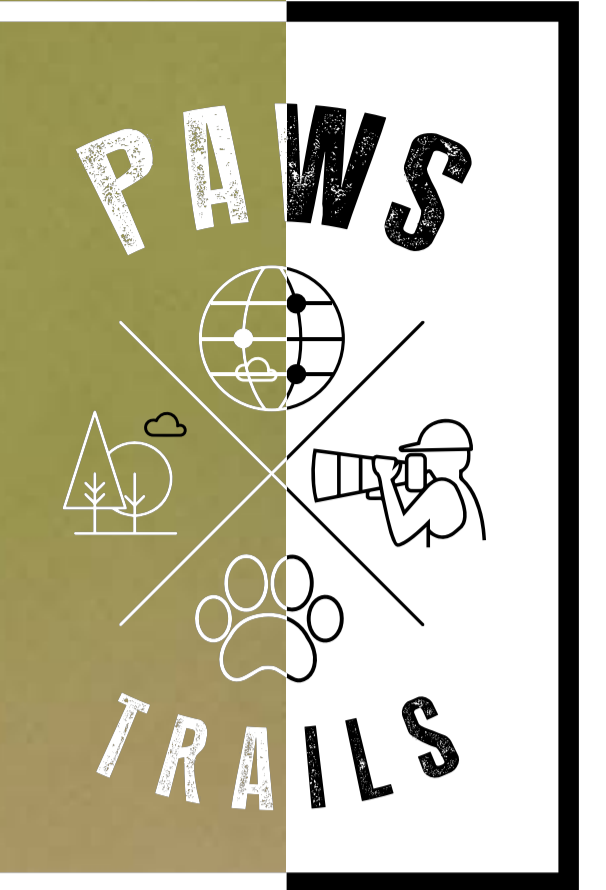


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Raghu Patteri
Editor

The mara ecosystem is famous for the big cats and other mammals which are present in abundance. It is lesser known that the mara alone has 500 plus species of birds, both visitors as well as endemic species. The lilac breasted roller is truly a rainbow bird, with a plumage of 8 different colours. In this edition of PT Aware, Dr. Peter Hudson takes you through the colourful lives of the lilac breasted roller.

It is a darling of the photographers who visit mara, with its size, colours and behaviour, all contributing to abundant photographic moments.

These sit and wait predators have the most curious of preying routine, which again gives you ample photographic opportunities.

Dr. Peter dwells into the biology of the bird and provides amazing insights on how species adapts to feeding opportunities that arise from ecological events of the habitat. The way this bird uses bush fires to source abundant prey is ingenious.

This article explains how the intersections of disease, habitat and the consequential impact on so many species is at the heart of understanding the ecology of the African savannah. The ways of nature are indeed amazing.

We thank everyone who contributed the beautiful images in this edition. Our next edition will be special on African lions, so please be ready with your lion images.



Kalika

Photo by: Kalika Shah



EDITOR'S DEN



FOUNDERS' NOTE

For frequent visitors to the mara like us, there is no getting tired of the lilac breasted roller. These birds are indeed a sight for the safari-tired eyes. The colours just pop, and it feels as if they have better temperament than super models for posing for photographs.

Those streamers on the tails are great to watch and their mating behaviour is also quite eye catchy. We are happy when visitors to our Mara Trails lodge spend time to observe and photograph these birds. With their colour and eye catchy behaviours, the rollers definitely help the vistsors to draw attention to the lesser-known species of the mara.

As always, while doing this edition, we were surprised by the beautiful images that the global PawsTrails community manages to cough up. Our thank you to all the wonderful photographer friends from around the world. Your images help bring life to Peter's narrative and help our readers admire the beauty of nature from different places. As always at PT Aware it has been our goal to associate with the best in the fields of research, conservation, and photography to bring magical tales of species and conservation to our readers.

This is the final edition of PT Aware for the year 2022. We thank all our readers for your support and patronage.

Hermis Haridas & Nisha Purushothaman

Founders - Paws Trails Explorers



THE STORY

The Rainbow Bird: The Lilac- breasted roller

By Peter Hudson
Conservation Director, Paws Trails

with Mary Fick,

Images by: Peter Hudson, Hermis Haridas & Nisha
Purushothaman



Canon
IMAGING PARTNER

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.

peterhudsonphotos.com



While most visitors to the savannah dominated woodlands of East and Southern Africa are focused on the large and charismatic mammal species, many are truly astonished at the fabulous diversity of bird life. The Mara alone has almost 500 species of birds, which include not only the local endemic species but also the large number of European migrants that move south into Africa for the winter months. The local birds are generally more colorful and include the spectacular bee-eaters, barbets, starlings, weaverbirds, cranes and of course the rainbow bird itself, the Lilac-breasted Roller (*Coracias caudatus*). The combination of 8 different colours, coupled with its large size and obvious flight, makes this distinctive bird a favourite for most visitors.

This is a bird of open woodland and savannah lands with a predilection for beetles, large grasshoppers, lizards, mice and really any reasonably sized prey that passes its perch. Like all rollers, they are sit and wait predators, so perch conspicuously in the open on tree branches, bushes and termite mounds while waiting to spot a potential prey. Such beautiful birds are an obvious target for photographers since they pose for great portrait shots and also because you know they will eventually jump from the perch and you can capture images of the colourful birds in flight as they swoop down on their prey, before throwing the wriggling item in the air for a straight swallow.

Not only is their plumage beautiful but they also have two outer tail feathers extended into streamers. Interestingly several other roller species have streamers and yet others have none. Initially you may assume these would be used in courtship flights when the males demonstrate their suitability as a father or in territorial disputes, but the roller species without streamers also undertake almost identical courtship and territorial flights to the same elaborate extent as those with streamers. When the birds are sitting, they twitch their tails regularly and so one could assume the streamers may be associated with balance or the gliding flight they use to chase and capture their prey. More likely, the streamers could be used for species identification by other rollers so that when they see an outline of a bird they know if it is from the same species. This could have some validity since when two related roller species coexist in the same area, they usually have distinctly different tail streamers.

Males and females

There is no clear sexual dimorphism in the species although males can be very slightly larger than the female, but this is only noticeable when the pair is sitting close together. One of the special features of these birds is the amazing rolling flight that gives the bird its special name. The bird flies to a height of several hundred feet



Photo by: Sajeew Kumar







Photo by: Jayaram Kulur

(about 100 m) then tumbles and power flies vertically downwards, rolling its body from side-to-side as much as 270°, and yet keeping its head still, and calling its raucous, almost crow like, “kraaa kraa” cry before sweeping back up into the air and repeating the display again and again. While you may assume that it is only the male that performs this display, both sexes are vigilant at the nest and distinguishing the sex of the bird when this display is performed is not easy, so it is quite likely that both sexes perform these displays. There again this display is often used as a territorial display and when two birds are observed displaying at the same time this could be a contest between neighboring males over the territory boundary.

All the roller species are highly territorial and defend nests and offspring vigorously, using their rolling flight in an aggressive manner towards intruders. Much of their defense is aimed at individuals of the same species. What resource the birds are defending is not apparent and could include the nesting tree hole, the availability of food for the young or indeed the availability of food during the difficult dry season. My guess is the latter since in this habitat we see that food during the dry season determines the success of many animal species such as the wildebeest and the lion.







Photo by: Anand Kumar

Field Research

I am surprised by how little detailed research has been undertaken on these rollers and we know so little about their social behaviour and demographics. For example, some species of rollers seem to tolerate non-breeders in their territory although it is not known who these individuals are or if they help at the nest. I suspect one limiting step with research is that one really needs to catch them and place colored rings on their legs to identify individuals. Often the trick to successful research is catching and marking individuals or at least recognizing individuals, so you can follow the individuals and work out why some succeed while others fail. Another limitation with the research has been getting access to the nest sites. While they nest in inaccessible holes, there is now much modern technology with probe cameras that would not disturb the birds and observations can be made remotely.

Without the original research, another approach is to look at the behaviour of closely related species and interpret this, considering observations on the lilac-breasted rollers. For example, our general knowledge of mammals and birds tells us that colourful birds communicate with their plumage and calls while mammals rely heavily on scent. Recent work on European Rollers (*Coracias garrulus*) has found that when a snake or a predator enters the nesting holes of the rollers they

vomit and produce an orange, foul smelling liquid that signals fear. When the parents return to the nest site, they smell this and respond accordingly, taking care when approaching the site. As far as I know this is the first time that birds have been found to use scent to communicate fear.

Food fires and feeding

Watching and photographing lilac-breasted rollers is a great treat and of course the primary reason we selected them for this issue of PT Aware. As sit and wait predators, they perch in locations where they can scan the nearby ground and vegetation for any movement and will remain on a perch for up to an hour before giving up on any prey arriving. When they do see a suitable prey item, they swoop down and usually land next to it and grab it before taking off to a relatively safe perch, the whole process seemingly relaxed and unhurried. Once on the perch, they beat the prey against the branch to ensure it is dead before doing the flip and swallow - this is what you need to be ready for to get an interesting shot. While they feed mostly on large insects they do occasionally catch a lizard or a snake and then they can take several minutes knocking it against a stick or the ground before swallowing. Their real expertise is in catching the hard beetles and even toxic animals, including scorpions and digesting them.



While they are essentially solitary feeders, a pair will often be seen together close to a herd of gazelle or a group of wildebeest and will follow them as the animals kick up insects from the grass. They will also congregate around fires when the insects get flushed by the fire and then they swoop through the smoke to catch the insects.

I would love to get a shot of a roller flying through flame with a large insect in its bill. While the Maasai herders still light fires to stimulate a green flush of grass for their cattle the number and size of fires have become relatively scarce.

The reason for a reduction in the number of fires in the Serengeti ecosystem is fascinating and reveals the connections and complexities of this ecosystem. Back in the 1950s, wildebeest numbers in the Serengeti were as low as 250,000 and the primary cause of death was from the viral infection that causes Rinderpest. This infection killed thousands of cattle and had caused large scale famine across Africa, one of the big and important disease induced effects rating alongside the bubonic plague and maybe Covid.

A vaccine was developed by a British veterinary researcher called Walter Plowright and he spent much of his life trying to eradicate the disease from cattle across the world. This was not an easy task but he succeeded and by 1963 the

disease was all but gone from cattle and this resulted in wildlife, most notably wildebeest and buffalo escaping the effects. The last known case in Kenya was in 2010 and the pathogen eventually listed as extinct in 2011. The consequence was an incredible increase in the size of the wildebeest population where numbers increased 5 fold to 1.3 million.

This increase in wildebeest resulted in the consumption of more grass and prevented the buildup of dead grass fuel so the number of fires caused by lightning was reduced and the area burnt in the Serengeti fell to a very small amount. This lack of fires, encouraged tree recovery so now the area of woodland increased which presumably gave more habitat for rollers even though there was less fire from which they could chase insects.

These intersections of disease, habitat and the consequential impact on so many species is at the heart of understanding the ecology of the African savannah and had additional effects for lions and other species. The subject of our next issue of PT Aware



Photo by: Anand Kumar













Photo by: Peter Hudson







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