



THE GREAT MIGRATION

by Markus Borner, Representative of the Frankfurt Zoological Society in East Africa

"Would the animals be able to go on living here? Were there enough plains, mountains, river valleys and bush areas to maintain the last giant herds still in existence? We had already noticed that large herds of wildebeest roamed outside the present boundaries of the park, and it was intended to change the borders to lessen its area. Nobody can follow these huge regiments of wildebeest and enormous armies of gazelles, and no-one knows where the hundreds of thousands of hooves will march. We were filled with fear and foreboding."

(Bernhard and Michael Grzimek –Serengeti Shall Not Die.)

Serengeti Magic

Every one who has a chance to see nearly two million animals on the move has been touched by the magic of this place. What is it that gets under our skin? – the urgency of the movement of the wildebeest? – the wide-open plains? – the African light? Or maybe it is the fact that we all come from here not such a long time ago and our deepest unconsciousness remembers the time, 6000 generations ago when we all lived in Olduvai? Or maybe it is just the sheer numbers of the migrating animals as they move in the world's last surviving great migration.

Today more animals move through the Serengeti plains and woodlands than the Grzimek's dreamed about. At least for the time being, their fears have not come true and the Serengeti lives as a true dynamic ecosystem, defined by the long lines of the wildebeest trek.

Even so the migration of the wildebeest defines the ecosystem, surprisingly little is known about the gnu (*Connochaetes taurinus*) itself and its wanderlust. The two Grzimek's were the first ones to try and assess their numbers and the routes. Never before where so many wild animals counted in such a remote wilderness so the Grzimek's came up with a new idea and brought in the first light aircraft to be used for monitoring and wildlife management, a move that changed conservation in Africa. By dividing the Serengeti into counting blocks they counted 99,481 Wildebeests in the Serengeti in 1958. The Frankfurt Zoological Society with Serengeti Wildlife Research Institute refined the original counting method and today vertical aerial cameras and high resolution video are used for counting the wildebeest.

The End of Paradise

When Bernhard and Michael Grzimek counted the wildebeest in the 1950ies in their Dornier aircraft they did not know that the population was at an all time low and

that the original migration had been much larger.

Around 1900, the disease rinderpest reached Africa from Italy through Ethiopia and played havoc in paradise. The epidemic ravaged Africa on an incredible scale, not only killing wildlife but domestic stock alike. Pastoralists, who depend on cattle for

their survival were hardest hit. We will never know how large the migration originally was, probably more than 2 Million individuals. Rinderpest knocked them back to a few ten thousand. As the disease continued to prevail in the cattle in the surrounding of the park, the wildebeest population in the Serengeti was re-infected continuously and stayed at its low level.

When in the 1950, vaccination campaigns in cattle eliminated the virus from the area, the wildebeest population was finally freed from the restricting disease factor and started to increase rapidly. During the early 50ies the few wildebeest migrated only East - West, from the plains to the west and back to the plains in the rainy season. With increasing numbers the migration had to search for new feeding pastures and remembered the old migrations routes to the north into the Masai Mara Game Reserve in Kenya.

With the rapid increase in the population of wildebeest, scientists predicted disasters through overgrazing and habitat destruction. Nothing like this happened: The population grew to about 1,3 million animals and then stabilised in the late 70ies, probably due to the limitation to their migration routes in the North and West and resulting food shortages in the dry season. Only once since then, in 1995, as a result of a severe draught, the Serengeti wildebeest population dipped below a million, but has recovered since.

The gazelle, which have their own, smaller, migration pattern, reacted to the increase of the wildebeest. Probably through food competition at the beginning of the dry season their population went down, but then stabilised on a new level. All evidence, that the Serengeti is still a functioning dynamic ecosystem.

The Zebras were never affected by rinderpest, but why their population remained stable over all these years of increasing food competition, increasing predation and increasing poaching is not clear to science yet.

Migrating: Wanderlust or Must?

The Serengeti wildebeest migration is as old as the history of mankind. Fossil finds in the Olduvai Gorge show that the wildebeest used the Serengeti plains seasonally more than one million years ago, long before the first modern men stalked them. For many millenniums the wildebeest followed the rains and used the Serengeti ecosystem with its mosaic of grasslands and savannahs to their advantage.

The wildebeest spent the rainy season from December to June in the volcanic open plains below the Ngorongoro Crater where the grass growth is most productive and nutrient contents high. It is here that the calves are born. Calving season is short and the predators cannot make a dent in the new-borns with such a sudden surge of food. When the monsoon rains stop in June, the plains dry out and the wildebeest move west towards Lake Victoria in search of pasture and rains. The plains become a harsh and dry semi-desert in which no wildebeest could survive. Only through migration can the wildebeest and zebra use the widespread resources of the ecosystem and build up such large numbers. The local climate of Lake Victoria, the second largest lake in the world, produces its own rainfall near the Lakeshore. When these local rains fail, the migration moves on to the north, into

dry season. With the onset of the monsoon rains in December the wildebeest move the Masai Mara, where the rift wall catches the last rains even in the middle of the back into the lush Serengeti plains.

Father and son Grzimek put yellow plastic collars on gnus and zebras in an attempt to study their migration pattern, today the Frankfurt Zoological Society is using the most modern Geographical Positioning System Satellite technology to do just the same.

Water – Source of all Life

Rainfall decides over life or death in the Serengeti. Like so many other things in the ecosystem rainfall drives the migration. To survive, the wildebeest need to follow the rainfall and the resulting water and food. How they achieve this miracle is one of the remaining mysteries of the Serengeti.

One thing that helps is that the young wildebeest in their first year of life get a “guided tour” of the Serengeti by their mother. It is possible that the older wildebeest know the approximate route of the migration. But this route is changing, influenced by the actual rainfall pattern. It has been proved that wildebeest can locate rain from over 50 kilometres. How? – We don’t know. Do they follow the lightning on the horizon? Can they get a bearing on the thunder? Can they smell the rain over a long distance? – The Serengeti still has a lot more questions than we can produce answers.

An Army without Generals

Beside the mother-calf bond, the wildebeest have no ties to families or herds, nor any hierarchy within the society. The large herds are not the result of a well organised social structure but a haphazardly thrown together bunch of individuals – a bit like the crowd in a restaurant or a football stadium. This has a genetic advantage as the population is continuously mixing anew, it also has an organisational advantage as there is no need for leaders (as for example with elephants). Any individual can start walking and tens of thousands might be following. Next day another individual walks ahead. If a lion or a crocodile eats the very temporary leader, the rest barely notice, the migration continues without interruption, looking for water and food.

Even so the wildebeest looks a bit like a clown and, according to an African legend, has been put together by God using left over spare parts, the animal is superbly fit for its migratory lifestyle. Wildebeest use the same amounts of energy per distance, whether they are running or walking, enabling it to use resources effectively that are far apart.

Crime and Accidents

There is little chance a wildebeest is dying of old age. About 3000 lions, 7000 hyenas and lots of other predators try to profit as much as they can from the wildebeest meat avalanche that thunders through the Serengeti. Again the migration has its advantages: None of the predators can follow the wildebeest and zebras, none has developed a matching migration systems. True, some of the nomadic lions follow for a distance, the hyenas have developed a “commuter” system, so they can prolong the time they can profit longer from the trekking herds and the vultures fly great distances to fill their stomach. But all of them are with all

the crime and accidents on the way, it is food shortage in the dry season Restricted by their home range and the migration moves on without them. Even that limits the wildebeest numbers, not the predators.

That is until man appeared. The Masai to the East of the Park do not hunt and, besides killing the occasional lion, live in harmony with the wildlife. But in the West of the park live traditional hunters, who have the same word for wildlife and for meat: "Nyama". Whereas the poaching of trophy animals is under control and very rare today in the Serengeti, meat poaching has become more organised and commercialised in the last few years. Smoked and dried game meat from the Serengeti is illegally sold on all the local markets. It is estimated that about 40,000 wildebeest are poached in snares every year. That is about as much as the migration can take. A model of the wildebeest population shows that the migration would slightly increase if this illegal offtake could be reduced. It also shows that the population would crash if control becomes lax and the poaching would double. It follows that no legal offtake can take place as long as poaching is as widespread as today.

Beside man another superpredator is lurking in the wings: virus. Disease has already once spelt disaster for the migration. With the increasing population pressure on the park, contact between domestic animals and wildlife become more common and with it the transmission of disease. A few years ago up to a third of the Serengeti lions were killed by canine distemper, originating from the domestic dogs in the parks surrounding. Rabies and distemper were responsible for the demise of the Serengeti wild dogs and even rinderpest is not completely eradicated. Every effort is being made to establish a "cordon sanitaire" around the park by vaccinating domestic animals in the surroundings.

Serengeti Mosaic

The Wildebeest are one of the most important pieces in the Serengeti ecosystem puzzle. It is firmly linked to many other puzzle pieces, some of which we do not even know yet that they are existing.

The wildebeest fertilise the Serengeti plains (all of 420 tons of dung daily!) and increase its productivity. The biting back of the grass produces new growth. They share the grass with Zebras and gazelles in a "grazing succession". During their migration the wildebeest are the basic food for many predators which depend on them. When they move, they eat back the grass and trample it, which in turn prevents hot fires, which destroy trees, which in turn.....

When Bernhard and Michael Grzimek worked in the Serengeti the diversity and the complexity of the ecosystem and the wildebeest migration overwhelmed them. They also were deeply moved by the magic of it all and decided to do everything they could to help the wildebeest, their migration and the magnificent ecosystem they were living in. Fifty years after their study and their initial pioneering conservation work, there are more animals in the Serengeti than before and the wildebeest can still follow their long trek for water and food. I have lived in the Serengeti for more than 20 years, but flying over the long lines of migrating wildebeest or watching them gather before a river crossing, still takes my breath away and makes my heart pound. Nowhere in the world can we watch such a spectacular scene, nowhere do we have such a large number and diversity of large mammals.

If we want our grandchildren to feel and enjoy the same, we have to continue the Grzimeks' work so the Serengeti will truly live.