

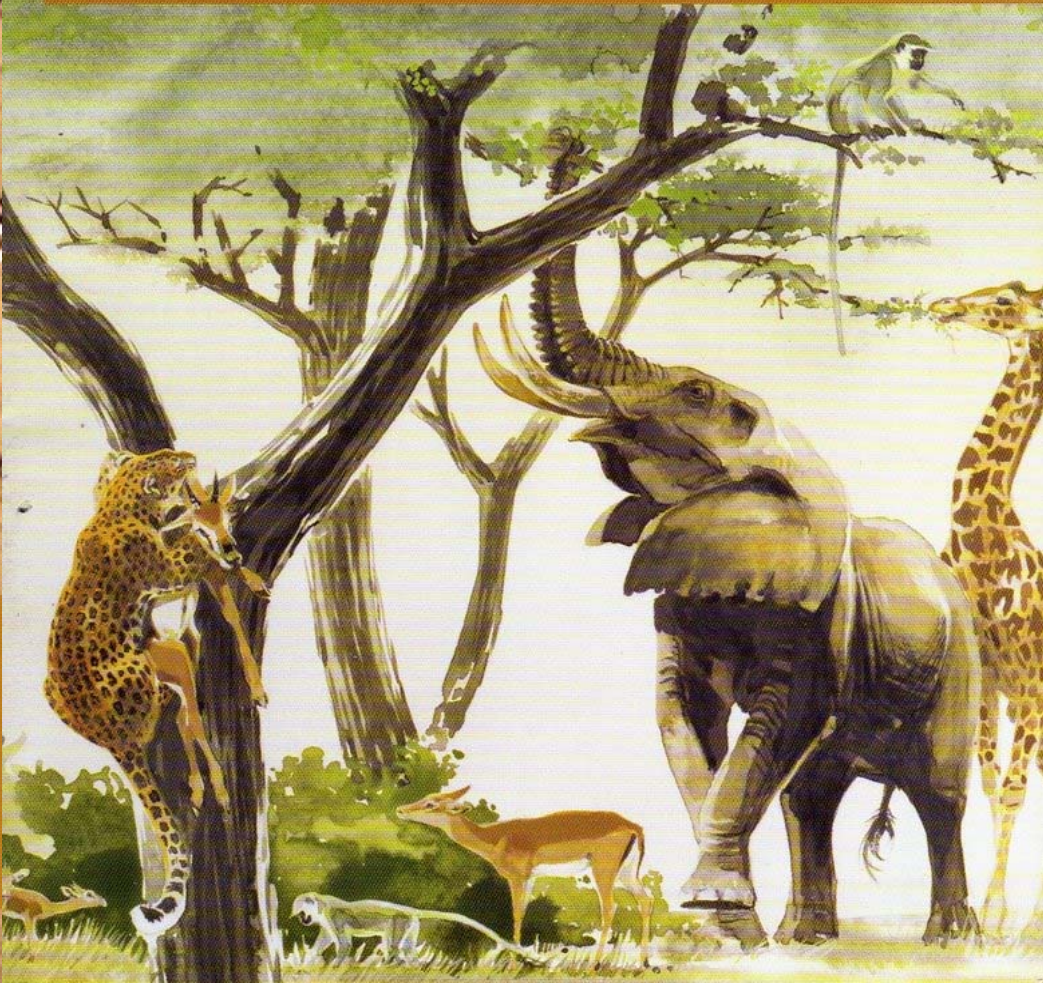


A Land of
Variety and Abundance



Serengeti

National Park



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National Park



Stiftung bedrohte Tierwelt
**Zoologische
Gesellschaft**
Frankfurt Zoological Society



Preface

Conserving the natural world's heritage is a daunting task in the 21st Century, with human populations and the consumption of the world's resources accelerating at an alarming rate. This is particularly true in Tanzania for, although we are blessed with outstanding wildlife and wild places, and none more impressive than the Serengeti Ecosystem, we also have the pressing needs of a developing nation. Nonetheless, since independence, our nation has strived to fulfill President Julius Nyerere's promise in the Arusha manifesto "In accepting the trusteeship of our wildlife we solemnly declare that we will do everything in our power to make sure that our children's grandchildren will be able to enjoy this rich and precious heritage." At Tanzania National Parks we are the current custodians of some of the most outstanding examples of this heritage in Tanzania and, although deeply committed, have the huge challenge of meeting both our conservation objectives and those of our nation. We are, however, well aware that commitment to the conservation of our natural heritage comes not only with visions of spectacular wildebeest herds, hunting hyenas or the sheer magnitude of open grass plains, but also with understanding of how these landscapes were formed and how the animals that fill this landscape cooperate and compete to mould the living body that is the Serengeti ecosystem today. Conservation education and 'spreading the word' is thus a high priority for TANAPA.

In TANAPA, there are two groups of people that we particularly cherish and with whom we must actively engage. First, it is vital that we win the hearts and minds of the communities of Tanzanians, living both locally and nationally. Without the understanding, tolerance and commitment of these people to the continued existence of the Serengeti, it cannot be enjoyed by future generations. TANAPA therefore takes the lead in conservation education for local communities, providing study materials and teacher training for schools, and showing conservation videos in Swahili in villages. Schools and community groups are offered free visits to the parks to demonstrate the importance of preserving these habitats. The Serengeti Visitor Centre and thus this booklet are key resources for obtaining neighbourly goodwill and enlisting the support of those who will inherit the parks.

Second, tourism provides the essential income we at TANAPA need to run and conserve our network of national parks and thus our visitors are warmly welcomed guests. By choosing to visit the National Parks of Tanzania, visitors are supporting a developing country's extraordinary investment in the future. Tanzania has accorded some sort of formal protection to more than one-third of its territory- a far higher proportion than most of the world's wealthier nations. Thus it is crucial that the international and national visitors to our parks have an outstanding experience and go away with a deep understanding and commitment to the landscapes and wildlife they have so enjoyed. We hope that the stunning images and information in the visitor centre in Serengeti and this booklet will go some way in generating these groups' enthusiasm and commitment for conservation.

We at TANAPA are grateful to the EU and FZS for helping us develop the Serengeti Visitor Centre, an outstanding example of how aesthetic and educational objectives can be met for conservation education. To you we say, please, take away this booklet and with it a little of the Serengeti magic both in your heart and your mind.

Gerald Bigurube, Director General TANAPA

Introducing Serengeti

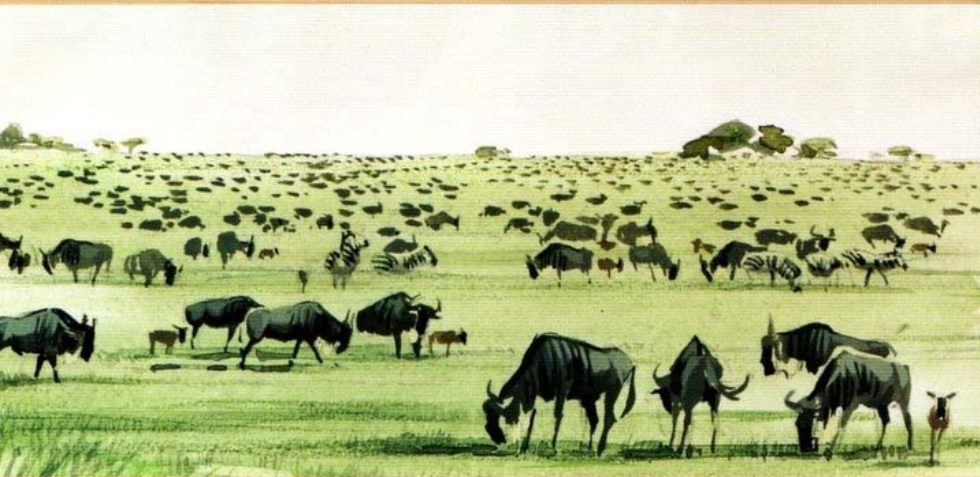
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A Quest for Food and Water

A long hard journey

Each year over 1 million wildebeest and 300,000 zebra migrate up to 1,000 kilometres following everchanging food and water supplies. Zebra often accompany the wildebeest, but may not travel as far west or north on their annual trek. Approximately 400,000 Thomson's gazelles have similar but shorter annual movements, and are often found with the wildebeest and zebra.



No typical year

The dry season sets the migrants moving from the southern plains to the northern woodlands. When the rains start again, the great herds return to the nutritious southern plains to calve. In this never-ending quest for good grazing, the route changes each year, sometimes sending them far into the western corridor or beyond the eastern boundary of the Park. Do you know where the herds are now?

A mixture of habitats and hazards

On their journey the migrants pass through three main habitats of the Serengeti - the short grass plains, the mixed acacia woodlands, and the riverine areas with names like Grumeti, Mara, Mbalageti, and Seronera. Each habitat has its own set of hazards.

Dining With the Migrants

The main course - quality or quantity?

Although wildebeest and zebra eat a variety of grasses, they have different preferences. Wildebeest, like cows are ruminants and prefer higher quality grasses. Zebra, like horses, can graze on lower quality grasses but need greater quantities. They can consume twice as much grass as a wildebeest in the same amount of time!

Life Begins on the Plains

Phenomenal grass

After the short rains the southern plains burst with luxurious green growth. The richest grasses in the ecosystem, these provide the migrants with the nutrition essential for successful rearing of their young. Female wildebeest need three times more energy for milk production than when they are pregnant.



Spectacle of birth

One reason why there are so many wildebeest is because they have evolved a short synchronised calving period. In a truly spectacular event, for approximately 3 weeks every year, over 8,000 wildebeest calves are born on average each day! To avoid predators, calves are on their feet in minutes, running at full speed within an hour.



Order or chaos?

By flooding the plains with calves, the wildebeest lose relatively few of their young to predators. However, with so many wildebeest massed together, chaotic separation of calves from mothers is common. They have developed an interesting reunion strategy to deal with this. Separated calves and mothers drop out of the herd, calling as they trot around seeking one another. Most are re-united this way.



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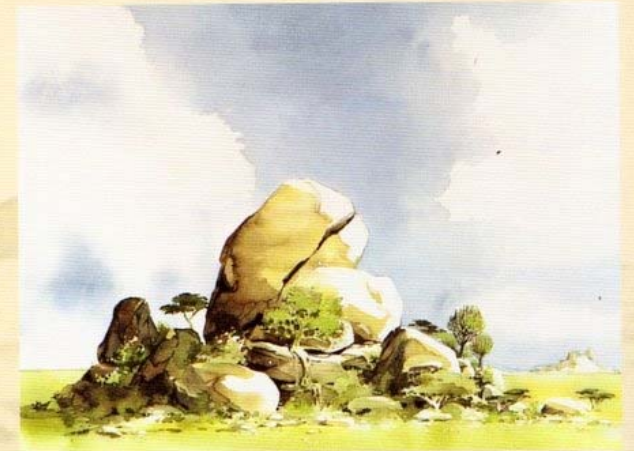
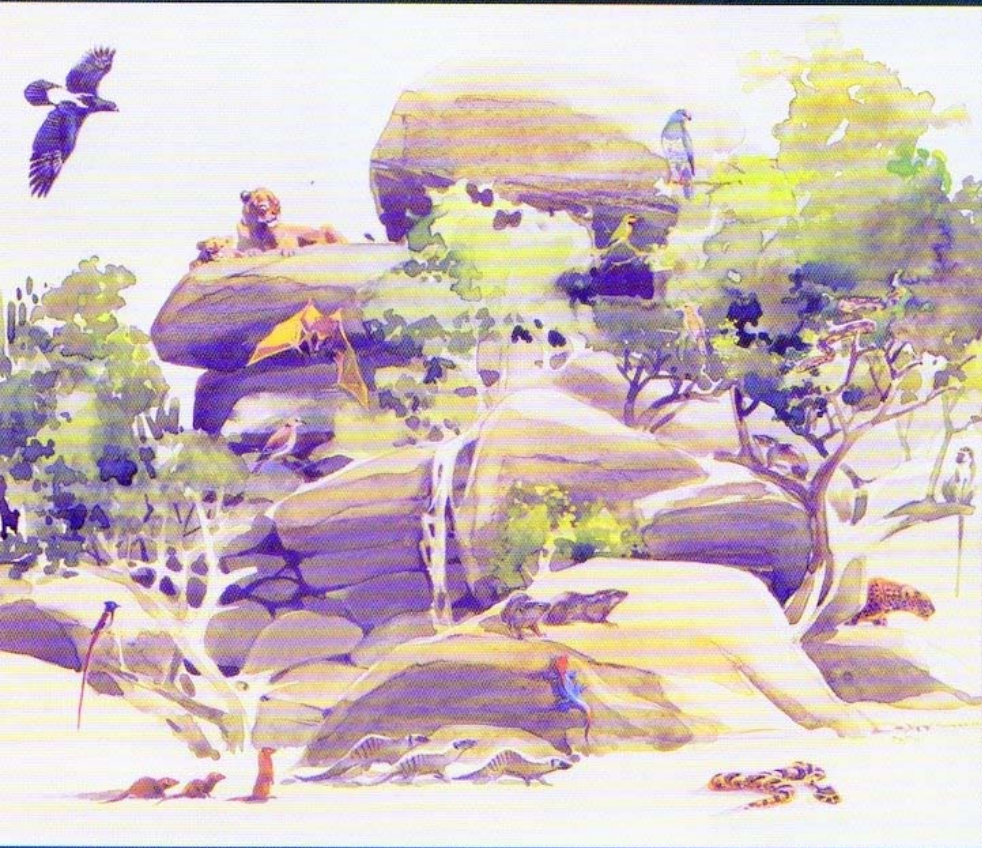
Kopjes: Reminders of the Past

Born of great forces

Some 4-5 billion years ago, molten rock was forced up into the softer sedimentary bedrock. This intrusive rock cooled slowly, and formed hard granitic plugs. Movements in the earth's crust forced portions of this granite to the surface. Over millions of years, wind and water eroded away the softer rock layers, leaving behind the harder granite plugs - the kopjes we see today. Most of the rock remains below ground, just as the top of a hippo's head is visible while the rest of its huge body lies hidden under water.

Ancient islands in a sea of grass

The rock forming this granite mass is some of the oldest rock you can see on earth. Like other rock outcrops dotting the plains and woodlands, it was formed before there was life on earth. These "kopjes" (pronounced "copies") are ecologically important, and an attractive feature of the Serengeti landscape.



Soil Deep Enough for Grass, Not for Trees

A sea of grass

The southern plains seem to stretch forever, hence the Maasai name "Siringet", meaning the land of endless space. The geologic forces that shaped this vast plain created an environment ideal for certain grasses, but unsuitable for trees. With specialised shallow-matted root systems, these grasses hold moisture from even the lightest rains.

Volcanic birth

From 3.6 - 2 million years ago, ash from local volcanoes - like Sadiman and Keramasi near Ngorongoro, coated the ancient plains. Rain soaked this ash, forming a hard, cement-like layer called hardpan. One volcano, Oldonyo Lengai, is still active today.

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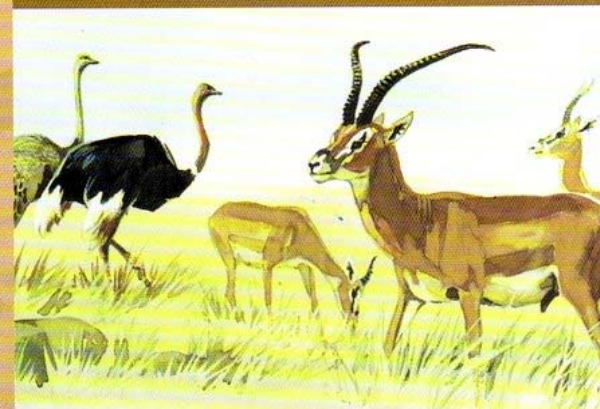
As Migrants Move-Residents Remain

Grass for growth

Young wildebeest grow 20 times faster than humans and they must keep moving to find the grass they need. The wildebeest herds actually promote grass growth by feeding on the plants and fertilising the soil. Just imagine that they deposit enough urine to fill 125 road tankers and dung to fill 500 tip trucks in one day! Over 6 million trampling hooves from wildebeest, zebra and Thomson's gazelles keep competing plants out, and the short cropped grass lowers the risk of fire.

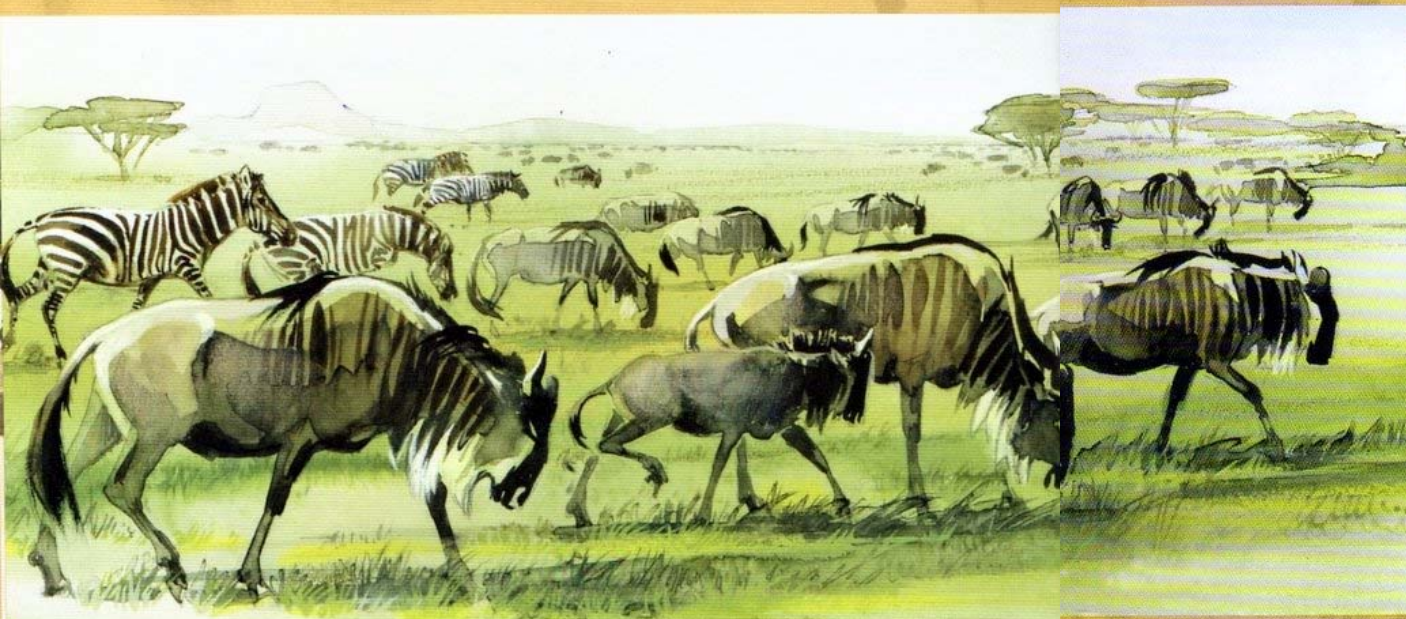
The dry season is the trigger

By May the plains usually begin to dry out. This stimulates the migrants' move north in search of better pastures. As grass quality becomes poorer, wildebeest may spend 18 hours each day grazing and chewing the cud, drinking about every 2 days.



Seasonal specialists

Some of the remaining residents survive on very little water. Resident Grant's gazelles and oryx that move into the southern plains in the dry season are masters at living off only the moisture they get from plants. Ostriches cool themselves with their large wings and conserve water by excreting a concentrated paste instead of urine. Unusual creatures like aardwolves, armadillos and pangolins obtain moisture from the termites and other insects they eat.



Tracking a Feast on the Move

Mobility matters!

The migration presents a spectacular feast for carnivores, but never in the same place. Only certain carnivores are mobile enough to follow the full cycle of the migration. These few have special ways to capitalize on this mass of meat.



Take to the air

Vultures are the greatest consumers of the Serengeti's mobile meat supply. Soaring superbly, vultures need only 5% of the energy to cover the same distance as a land-based animal. Cliffnesting Ruppell's Griffon vultures travel daily from the Gol Mountains east in the Ngorongoro Conservation Area to feed on the migrants' carcasses. This daily trip can take up to 8 hours and covers 100 kilometres.

Feast While you Can

Making the most of the migration

Lions are large and powerful while leopards kill by cunning ambush. Each species is primarily territorial, and less mobile than spotted hyenas, vultures, or the other Serengeti large cat, the cheetah. They prey on the migrants only while they pass by. Wildebeest or zebra is the Serengeti lion's favourite meal.

Being a carnivore is not easy

Social constraints like fierce territoriality prevents these predators from following the migration. For over half the year, the migrants are too far away to hunt. During these lean times, they must rely on a variety of resident animals for food. For lions, that means mostly warthog and buffalo.



Larger families, greater risk

Each of these large carnivores rears larger families than hyenas or vultures. Solitary leopards may raise up to 4 young, usually during the rains. Lions may raise up to 6 young. However, the lions' harsh lives result in 6 out of 10 cubs dying in their first year of life!

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Commuting is the Key

Long distance runners

Spotted hyenas are the most numerous large carnivore in the Serengeti ecosystem. They roam effortlessly for hours in their characteristic loping gait. Like vultures, spotted hyenas have developed special ways to exploit the wildebeest and zebra migration throughout the year – the only large carnivore in the Serengeti ecosystem to do so.

Free passage

Serengeti spotted hyena clans defend permanent territories, signalling the location through calling, scent marking and fighting. As resident animals are few within these territories, some clan members must leave to feed on the migratory herds. To do so, they may pass through potentially hostile hyena territories. Travelling as much as 3-4 days on trips up to 200 km, this free pass is vital, and ensures no unnecessary fighting.

A small family with plenty of support

Hyenas raise small families of 1-2 young. To care for their cubs, hyena mothers travel up to three times the distance of the wildebeest migration each year. Only the mother provides food for her young. When nursing mothers leave to feed on the distant herds, their cubs are left in communal dens awaiting their return.



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What is Shaping the Landscape?

Soil depth

The south-eastern region of the ecosystem has shallow soils that hold little water and primarily support grasses. The northern and western regions have deeper soils that hold more moisture and encourage woody plant growth. Seronera, where the Visitor Centre is located, lies in a transition zone between these two regions.

Moisture availability

Two rainy seasons drench the ecosystem. The long rains usually fall between February and May; the short rains between October and December. In the intervening periods, the hot tropical sun quickly bakes the landscape. The Serengeti's rivers provide permanent pools, accessible ground water, and relatively deep soils. These riverine areas have their own lush vegetation and support many specialised animals.

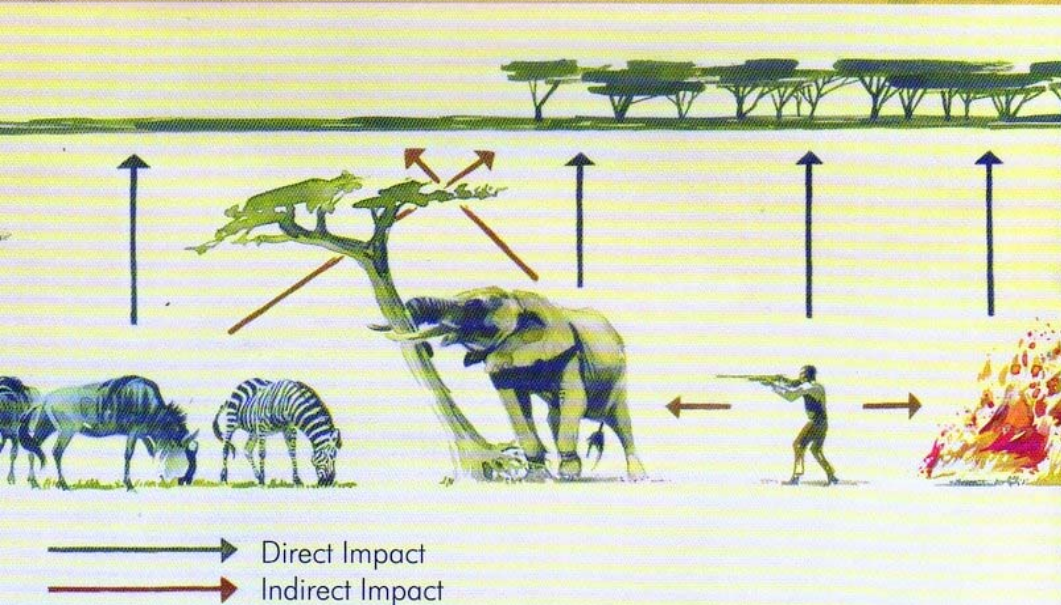
What is Changing the Landscape?

Animals

The vast migratory herds devour massive quantities of grass. With less grass to burn, fires are less damaging, allowing young trees to survive. Elephants browse heavily, often destroying whole trees. Both have different but significant impacts on tree regeneration and growth.

Humans

The woodlands are advancing. Frequent fires started by man early in the dry season have encouraged the spread of these habitats. Poaching decimated elephant numbers, allowing new woodlands to mature. Large wildebeest herds, that recovered in the 1960s from an introduced cattle disease called rinderpest, now keep grass quantities low and reduce the occurrence of fires destructive to trees. A part of the Serengeti ecosystem from pre-historic times, humans continue to have direct and indirect impacts of great consequence.



Fire intensity

Fires started early in the dry season on still-green grass are not intense enough to destroy woody vegetation. By clearing underbrush, these fires promote tree growth. Fires started late in the dry season are more severe, destroying woody vegetation and maintaining open grasslands. Some fires occur naturally; others are set by man, either for management reasons or illegally by poachers and cattle thieves.

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Life on the Move

Mating on the hoof

In a spectacular and intense display of animal behaviour called the rut, thousands of territorial wildebeest males call frequently as they frantically herd, chase, and mate receptive females. Ready to mate for less than one day, females actively seek out as many males as possible. Males vigorously defend mobile territories half the size of a football field during this short but exhausting 3 weeks period.

Perilous waters

The herds must cross seasonal rivers as they move in search of greener pastures. The danger of a flowing river is risked as thousands of migrants leap into the water. Injuries to the thrashing, panicky wildebeest and zebra are common.



Death waits patiently

The Nile crocodile poses a formidable threat, lunging and snapping at migrants as they drink or cross. Hyenas and lions attack calves separated from the herds, or take those clambering up the steep, muddy river banks. And if that isn't enough, flash floods may carry away thousands of struggling animals.

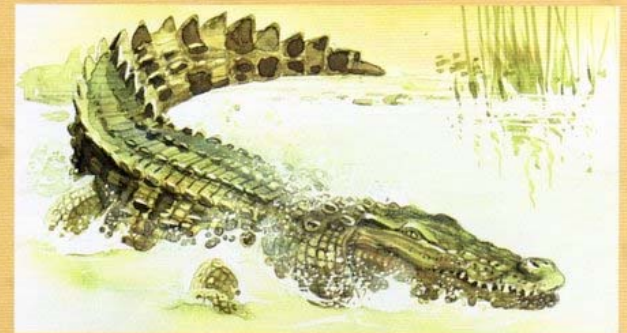
Life on the River

A mixed blessing

Water is the key to life, and sometimes the route to death. Compelled to drink from the river's edge and cross to the other side, the migrants enter a danger zone. But for many, these rivers are a food source, a resting place, a nest site, or a home.

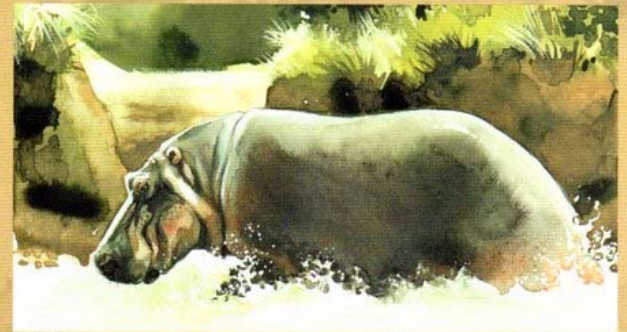
Crafty crocodile

The largest carnivore in Serengeti, the Nile crocodile can weigh up to 1 ton and may live to be 100 years old. Crocs can survive for up to a year between feasts!



Heavy hippopotamus

The largest river inhabitant, the adult hippo weighs more than a Land Rover and is able to run much faster than a human. Nightly they venture many kilometres from the rivers to feed, consuming up to 60 kgs. of grass each!



Hearty hammerkop

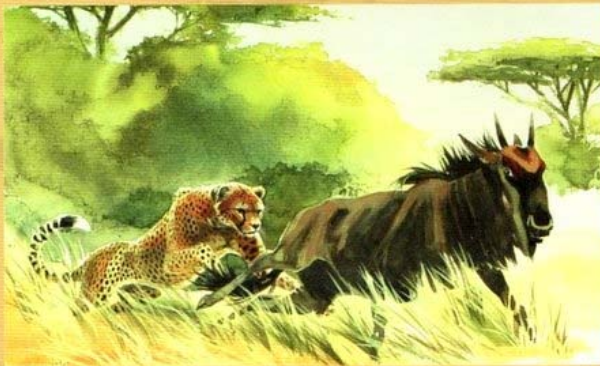
This bird builds a huge nest of sticks and grass. It feeds on frogs and tadpoles, often using one foot underwater to disturb its prey. Abandoned nests are re-used by snakes, like pythons, as well as bees and owls.

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Surviving the Dry Season

A hazardous trek

On their way north, many migrants move along the densely populated western edge of the ecosystem. Here conflict with local people occurs. Poachers and hunters may kill tens of thousands of wildebeest each year.



An anxious wait

The northern woodlands are graced with twice as much rain and have deeper soils than the plains. Permanent water and reliable but lower quality grasses attract the migrants during the dry season. This is the most difficult time of year for the wildebeest. The availability of good grazing during the dry season is the most critical factor affecting the survival of both young and old wildebeest during the year.



Problems with predators

Thicker woodland vegetation provides cover for predators to ambush the migratory herds. Even cheetah survive in this dense cover, although little is known of their habits in the woodlands. Serengeti cheetah follow the migratory Thomson's gazelles throughout the year. The cheetah's need for mobility is probably why most are not territorial, and may contribute to the high death rate of their large litters - each cub has only about a 1 in 20 chance of becoming an adult.

Footprints in Time

How much longer will the migratory cycle continue?

No one can be certain, but with proper conservation management, this vast animal migration - one of the last left on earth - should survive.

How long has this timeless journey gone on?

No one knows, but scientists believe the Serengeti migration is much the same today as it was during the time of early man.

The Cycle Continues

Why journey south?

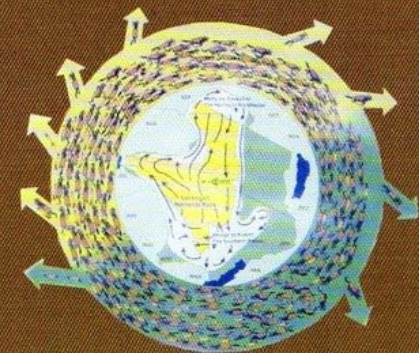
With the arrival of the short rains, the migrants move south with many pregnant females in their midst. The wildebeest now need more nutritious grasses rich in minerals, such as phosphorous which is essential for rearing healthy calves.

Why are the wildebeest so numerous?

The main reason for their tremendous numbers is their migratory behaviour. First, their annual cycle allows them to make the most of Serengeti's changing grass conditions. Second, their great mobility helps them escape predation, which keeps predator numbers low. In addition, they have evolved specialized traits like a short synchronized calving season that contribute to making them the most successful large herbivore in the ecosystem.

The journey never ends

Since leaving the southern plains, over half the calves born during the year have died. Each year, they return south and replenish their numbers. This annual spectacle dramatically illustrates an unequalled cycle of life and death. It continues to astound all who are fortunate enough to witness it.



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Tanzania National Parks

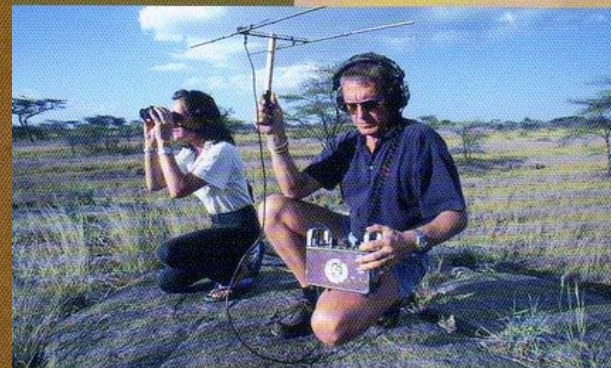


The Tanzania National Parks Authority, TANAPA, was created in 1959 to oversee the growing roster of national parks, which now comprises Arusha, Gombe, Katavi, Kilimanjaro, Kitulo Plateau, Lake Manyara, Mahale, Mikumi, Ruaha, Rubondo, Saadani, Serengeti, Tarangire and Udzungwa. These parks cover over 7% of the country and many are at the core of a much larger protected ecosystem. The existing park system protects a number of internationally recognised bastions of biodiversity and World Heritage sites. The gazetting of Saadani and Kitulo National Parks in 2002 expanded this network to include coastal and montane habitats formerly accorded a lower level of protection. No hunting is allowed in National Parks; all flora and fauna are offered total protection and human activity is monitored and all development regulated. TANAPA is committed to sustainable, low impact tourism, with protection of the environment the primary objective. Tanzania National Parks is a parastatal organisation and thus is fully self-financing without any government subsidy. Revenues from visitor Park fees are ploughed back into the protection, maintenance and development of the National Parks system. TANAPA's highest body is its Board of Trustees. The Director General of the organisation is Mr Gerald Bigurube.



The European Union, Dar es Salaam

The European Union has a long-standing partnership with Tanzania and currently funds a EUR 100 million support programme, financed from the European Development Fund and from the EU budget. Together with individual Member States' programmes and the EU programme, this support accounts for over half the external aid to Tanzania. Although much of the EU programme in Tanzania is focused on supporting Tanzania's own development efforts, including infrastructure, agriculture and education, the EU also finances projects in the fields of AIDS prevention, the environment, and the fight against corruption and for good governance. The EU also works at the grass roots level by co-financing over 40 projects with NGOs in Tanzania. The funding of this visitor centre in the Serengeti National Park was just one of a range of environmental and conservation projects that the EU has supported in Tanzania. The European Commission manages the EU aid programme through its Delegation based in Dar es Salaam. The Delegation coordinates closely with the Embassies of the EU Member States in Dar es Salaam, to ensure that European Aid makes a coherent and effective contribution to Tanzania's development efforts.

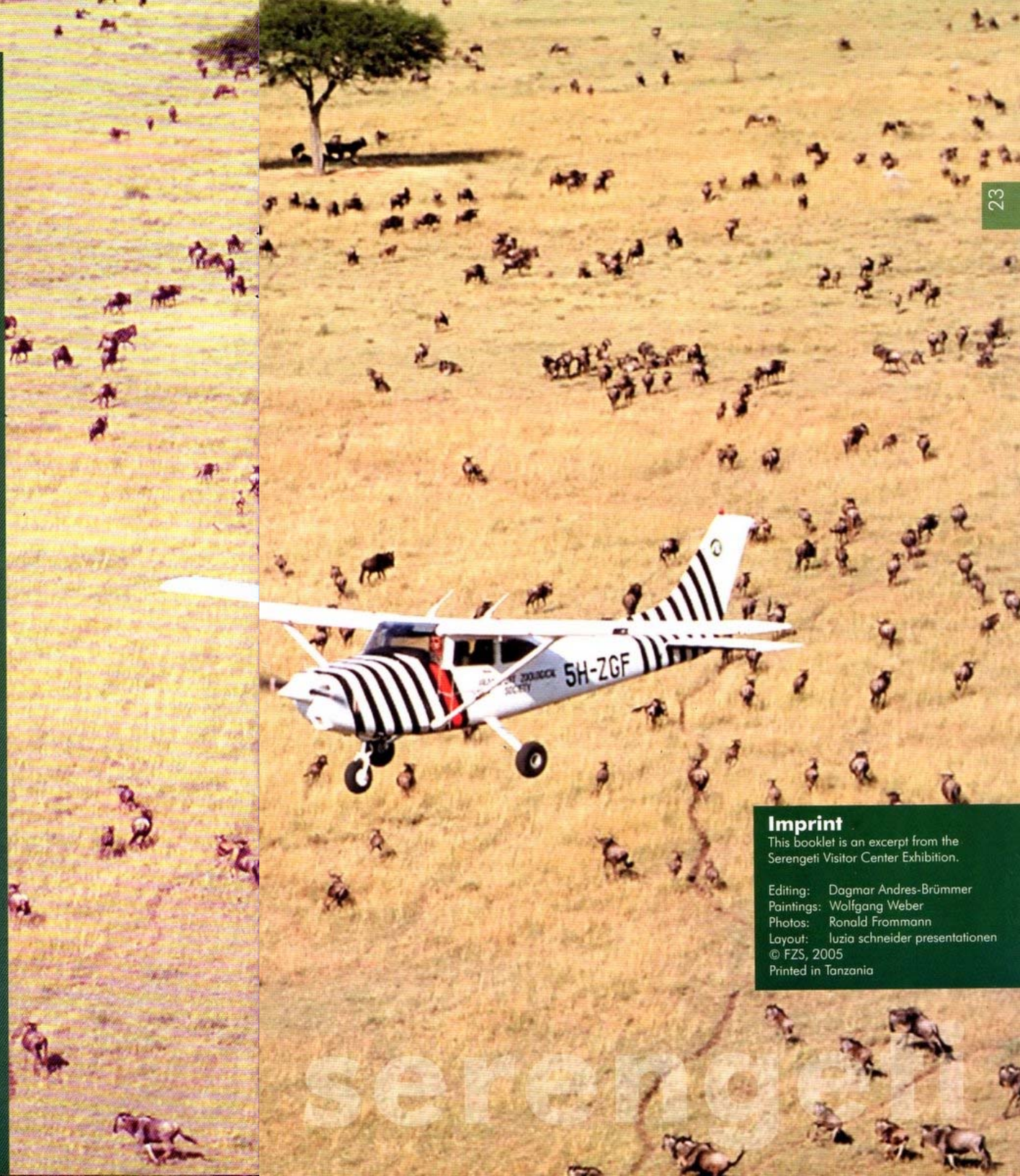




Frankfurt Zoological Society

The Frankfurt Zoological Society (FZS) was founded in 1858 to build and run a Zoological Garden in Frankfurt, Germany. After the Second World War, Professor Bernhard Grzimek became the Zoo Director and President of FZS. During the early 1950's, Dr. Grzimek and his son Michael travelled to the then Tanganyika and began a new phase in FZS development. Their landmark studies in the Serengeti National Park provided the first numerical estimates of the now famous migratory wildebeest, zebras and other animals. Thereafter, Dr. Grzimek both raised funds through his famous television series in Germany "A Place for Animals" and expanded the activities of FZS within Tanzania and around the world, whilst continually lobbying governments to make conservation a priority.

Today, the Society has expanded its conservation activities to more than 90 projects in 30 countries on four continents. What sets Frankfurt Zoological Society apart from other conservation agencies is its long-term commitment to areas, particularly in Tanzania. This is made possible, in part, through the interest generated from the Trust Fund Grzimek set up, along with private and government donations. FZS has been supporting TANAPA and the Serengeti National Park for over nearly 50 years in a close relationship. The Society's annual budget for Tanzania currently exceeds one million Euros, with approximately half of that spent in the Serengeti Ecosystem. The Society provides infrastructure and equipment, operating costs, training of all levels of park employees, and provides funds for park planning. FZS also funds research and monitoring of Tanzania's wildlife, as well as supporting educational and community outreach and development programmes for the Tanzanian communities around the Serengeti. The Frankfurt Zoological Society maintains a long term and unwavering commitment to the future of the Serengeti and Tanzania's wildlife.



Imprint

This booklet is an excerpt from the Serengeti Visitor Center Exhibition.

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Paintings: Wolfgang Weber
Photos: Ronald Frommann
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Printed in Tanzania