

HModule # 7 – Component # 9



The African Elephant – *Loxodonta africana*

Welcome to **WildlifeCampus** and our Elephant Component

This component takes a close look at the world's largest land animal. It explains its origins, distribution, complex social structure, incredible diet, amazing means of communication, reproduction, conservation status and its future among other topics including tusks and trunks.

This component like most of the others offered here on WildlifeCampus is packed with camera captured imagery **chosen AfriCam.com** visitors, goto www.africam.com to submit your favourite images.

Through a combination of text and images we have attempted to reveal to you the elephants' and many other creatures full ecology.

Completing this component is **completely free from obligation** - enjoy with our compliments.

Classification

Elephant are classified in the following manner

Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Proboscidae
Family	Elephantidae
Genus	<i>Loxodonta</i>
Species	<i>africana</i>

Common names

English	Elephant
German	Elefant
French	Elephant
Afrikaans	Olifant
Zulu	Ndlovu
Swahili	Ndovu, Tembo

Introduction

The only **extant** (living) species in the Order Proboscidae are the elephants. The order, however, includes a number of other, now extinct species. The earliest record of a member in this group was a small pig-like creature called *Moertherium*. It lived in a swamp area in what is now modern day Egypt some 50 million years ago. There were a number of other species like it who in turn evolved into the **Woolly Mammoths** and **Imperial Mammoths**. From these earlier forms of the Proboscidae we now have the last two living species of elephant, the **Asian** and **African** Elephant.

Recently, there has been much debate over the status of the **Forest elephant** (*Loxodonta cyclotis*), which is found in West and Central Africa. Originally classed as a **sub-species** of the African elephant, new research has indicated that the two may in fact be separate species. The African elephant and Forest elephant are morphologically different and exhibit different social behaviours, but these differences were previously ascribed to a physical adaptation to different habitats. Genetic research has indicated that the differences at the cellular level between the two sub-species may be significant enough to recognise two distinct species. The debate is yet to be resolved.

A great deal of mythical folklore surrounds these magnificent giants of the bush. A few of these legends are worthy of being recounted. However the origin of these myths have become quite unclear over the years, and no specific tribe of people can be directly credited with them. The most likely source though, would appear to be the Shona, a tribe ancestrally inhabiting the northern regions of Southern Africa.

Myth & Legend

Indigenous people speak about the pair of "wisdom sticks" that the elephant carries on either side of his temples. They believe that these sticks enable the elephant to know time and place of its own death. That is why they believe that very old tuskers are often seen without their herd, preferring to find a hiding place to die, thus maintaining their dignity, as they wish to die alone and in peace.

There are also many superstitions as regards to the hunting of elephants by local people. A hunter that sets out nursing a secret grief or grudge, will only wound his prey and will not get a kill. Also tuskless elephants will charge and kill those who are guilty of adultery, unless they immediately confess their guilt to the elephant. Thus no hunter will allow others to accompany him, unless he is sure that his companions are not harbouring grief or a grudge or are guilty of adultery.

If the hunter meets an elephant with his trunk curled around his head, he will know that some tragedy has struck his home. Should he see an elephant flinging earth over his back he will know that his wife is bathing or swimming, not something that she is supposed to be doing while he is out hunting. And lastly elephants are believed to swallow a pebble every year, so as to keep a count of their age.

Vital Statistics

Shoulder Height	3.28 m [11 ft] ?	2.83 m [9ft] ?
Weight	5500 kg [12 100 lb.]?	3700 Kg [8140 lb.]?
Gestation period	22 months	
Food preference	50 % grass, 50 % trees	
Maximum Charging Speed	40 kph [25 mph]	
Average Walking Speed	10 kph [6 mph]	
Social Grouping	Matriarchy	
Territory Size	15 – 2,200 Km ²	
Longevity	? 65 years	
Record Game Auction price	R 240 000 (\$ 37 000) - large tusker	
Record Game Auction price	R 15 000 (\$ 2300) - average specimen	
Record Tusk Weight	102.3 kg [225 lb.] – L	97 kg [213 lb.] - R

African Elephant - *Loxodonta africana* (Blumenbach 1797)

The African Elephant is the **largest land mammal**, with mature bulls reaching a record weight of 7 tons [**15 400 lbs.**]. Elephant cows average **two and a half metres tall** and three tons. **Both sexes have tusks**. Sexing elephants is not easy, but a few differences other than size may be apparent. During periods of heightened sexuality males may exhibit a large wet area on the side of their heads from a large gland. Females seem to have a more convex rounded forehead than the males. **The height of elephants** can be **roughly calculated** from foot prints, as twice the circumference of their front foot gives their approximate height in **normal habitat**.

Elephant are also known as **pachyderms** (Greek). This is a reference to their very thick skin which may be more than 3cm [**1 in.**] **thick** in places, specifically their **legs** and **rump**.

Food and Feeding

Elephants are both **browsers** and **grazers**, utilising a very wide range of plants. Ecologists now classify them as mixed feeders, a term also applicable to Impala and Eland. **Grasses** are most often taken just **after a rainy season**, with **trees** and browse making up the **majority of their diet**. Over **90 different tree species** are utilised by elephant, although the **Mopane tree** (*Colophospermum mopane*) seems to be highly favoured.

When eating off a tree, the **leaves** as well as **bark** and occasionally the **roots** are taken. This often has a **real detrimental effect on the tree**, especially when a whole tree may be pushed over just to reach the choice new growth in the canopy. Thus when elephant populations exceed their **ecological carrying capacity** large areas of woodland may be **severely damaged**. Eventually this will impact on their numbers, but the destruction is **first felt** by lesser browsing species such as antelope. However, in areas where **severe bush encroachment** has taken place, especially by Mopane, the elephant are quite beneficial, **improving the habitat** by opening up dense woodland for other species.

Elephant are **not very efficient** feeders, not only in their physical taking of vegetation, but also digestively. In fact elephants only **digest some 40 %** of what they eat, and being of such immense size, they require at **least 170 Kg [470 lb.] of plant matter daily**. Elephants are also **highly dependent on a stable water supply**, drinking up to **160 litres [42 gallons] of water per day**.

Social Organisation

Elephants are organised into a number of social groups. The first and most common are **large herds led by a matriarch**. This consists of a **related group of females** incorporating mothers, their young, grown daughters and their offspring. Herd size may range between **two and twenty four**, but typically 9 - 11. However, reliable accounts have recorded elephant herds **numbering 200 individuals and more**. These usual number may be due to **habitat degradation** or **limited resources**, encouraging herds to gather around available resources.

The members of this family group keep together, rarely venturing 50 metres from their nearest neighbour. **Activity, direction** and **rate of movement** are all **set by the matriarch**, who is recognised as the **largest cow**. When the herd is disturbed, they all cluster around and turn to the matriarch for leadership. Due to the fact that leadership and experience play such a crucial role in the lives of elephant herds, the females' lifespan extends far beyond their age of reproduction. **Long term postreproductive survival is also true of man**, but otherwise quite **rare** in the animal kingdom. When matriarchs become between 50 and 60 years old, they either leave or are abandoned by the herd, and the next oldest cow assumes leadership.

Male elephants leave the maternal herds at **adolescence around 12 to 19 years**. Separation is a gradual process, and the adolescent bulls may become peripheral, following the maternal herd at a distance. They **don't necessarily leave voluntarily**, but are pushed out by the older females or their mothers due to an intolerance of the boisterous and sexual precociousness of pubescent males. After becoming independent, they either wander alone, or more commonly join **bachelor herds**. These herds typically number between 2 and 14, but may grow up to **144 individuals** in some sort of temporary arrangement.

The period when bulls seek cows for mating is called the **musth**, at which time mature bulls **leave their herds and wander alone in search of receptive cows**. When bulls are in musth they are very noticeable by a combination of the following characteristics:

- ~~///~~ Their **temporal glands** are functional and discharge a copious, strong smelling, **watery secretion** that runs down the sides of their faces.
- ~~///~~ They may be constantly **dribbling urine**
- ~~///~~ Their penis may take on a **greenish tinge**
- ~~///~~ Increased **aggression**
- ~~///~~ Increased association with female herds

Due to the fact that **musth** is **correlated** with a period of **increased sexual activity** and **aggressiveness**, an elephant bull encountered in this condition should be left well alone. Few of those elephants that come into musth will get the opportunity to mate, and therefore there will certainly be a number of very **frustrated animals** about, each quite capable of overturning your vehicle – keep a safe distance.

Among males **25 – 35 years of age**, musth may only last **several days or weeks**. In older animals musth may continue for up to 5 months. During this period males often **wander over great distances** in search of a receptive female in oestrus. Musth may also be an **accurate indicator of the health** of elephants. It has been found that animals in poor condition do not come into musth and animals that become ill or are wounded while in this condition drop out of it. This is another mechanism of **natural selection** to ensure that only the stronger genetic material is passed on.

For more information on Natural Selection, please refer to Module # 1, Component # 2 – Evolution and Natural Selection.

Communication

Before examining their reproductive behaviour, some mention of elephant communication is necessary. This has been particularly well studied, and includes **tactile, olfactory, vocal** and **posturing communication**. Their very wide array of signals and gestures include **greeting, caressing, slapping, checking reproductive condition, rumbling, trumpeting, squealing, screaming** and over 30 postures and movements covering **dominance, threatening, defensive, submissive** and **fighting displays** of various degrees.

These are all readily observed and seemingly understood by us, but recent on-going research is exploring the elephants ability to communicate **ultrasonically** in what scientists are now calling **Infrasound**. These are sounds outside of our range of hearing, but are capable of travelling **tens of kilometres**.

Reproduction

Female elephants in oestrus exhibit certain behaviours in the presence of adult bulls. Cows out of oestrus allow any bull to check on their reproductive condition, but cows that are nearing receptiveness acquire what is known as an **oestrus walk**. In this condition the female **becomes wary** of any approaching bull and walks away. If he is persistent, the oestrus walk changes into an oestrus chase. She only stops moving when and if he manages to touch her. First he lays his trunk on her shoulder and head, then rests his tusks or chin on her rump, for a bit of leverage to mount her. Bulls have been described as being their most magnificent now, and may **display an erection between a metre and two metres long [3 – 6 ft.] weighing up to 30 kilograms [66 lb.]**. Mounting and copulation are usually **completed within 45 seconds**.

*As an aside the elephant does not qualify for the most well endowed male in proportion to body size. This honour belongs to a species of **fly** in the Class *Insecta*, who is endowed with a reproductive organ in excess of **two and a half times his body length** when extended.*

After the longest gestation period of any animal, some **22 months**, a **single calf** is born. Cows give birth standing, in the midst of the herd, and the new calf may weigh 129 Kg [**284 lbs.**] and stand 90 cm [**36 in.**] at the shoulder. The calf can stand and walk within a few hours, and **suckles with its mouth, not trunk** from two mammae between the mother's front legs. The calf will **suckle for two years**, or until its tiny protruding tusks begin to irritate its mother. The calf starts to **experiment on vegetation** at six months. They will basically be fully independent in **ten years**, the second longest period of **adolescent dependency** after humans.

Tusks and Trunks

There are many striking features belonging to the elephant. One is naturally the trunk. This is essentially an **extended nose**. This is a very powerful organ, which is **highly flexible** and **dextrous**. The tip of the trunk ends in two almost finger like **prehensile projections**, capable of some very precise co-ordination. The organ is used in **drinking by sucking water up it, and then squirting it into the animals mouth**. It is also used in eating, with the prehensile tips picking food from the ground or directly from a tree and directing it into the mouth. The trunk is also obviously used for **smelling**.








The second striking feature is also the feature that **has almost resulted in the animal's extinction**, its tusks. Although both sexes may possess them, they are far **larger in the males**. In the cows if they grow tusks at all, they cease growing when the cows are fully mature at 20 to 30 years. However tusk growth in males begins almost exponentially from the time they **mature to the time they die**. Not only do they grow longer, but they **thicken** substantially. Their two pillars of ivory are basically **elongated upper incisor teeth** that protrude from the mouth.

Ivory has been much sought after for millennia. It has been used in a multitude of ways from **carved figurines** to **knife handles**. It has been ground up for **traditional medicines** and manufactured as **cue balls** and **piano keys**. For these reasons the elephant has been ruthlessly hunted to the point of near extinction.

The Magnificent Seven

Over the past 350 years of man's interaction with Southern African elephant **many hundreds of thousands were encountered**. Sadly many hundreds of thousands were also shot. However out of all these animals there is a small group of individuals that bears mentioning.

The Magnificent Seven were the **seven Kruger National Park elephants** with the **largest tusks**. Their names were:

-  Joao
-  Ndiuiamithi
-  Kambaku
-  Mafunyane
-  Dzombo
-  Shawu and
-  Shingwedzi

Their tusks (where recovered) are currently on display in the Letaba museum in the north of the Park

Joao is the only one of the Magnificent Seven **still alive**, but his tusks were **broken off in 1984**, possibly in a fight. Look out for him near the Shingwedzi rest camp in the north of the Kruger Park. His tusks are short stumps now and he wears a **radio-collar with a transmitter** attached to it so that the game rangers can keep track of him. During 1982 he was shot four times by poachers, but luckily he survived each time.

At present, the scientific services of the Park are slowly in the process of **identifying the next Magnificent Seven**. Thus far the following individuals have been provisionally selected, but it will be many years before we're able to tell if they live up to the title of Magnificent:

Elephant	Location	Description
Duke	Southern Kruger	Tusks reasonably straight, his right is longer than his left
Tshilonde	Northern Kruger	his right tusk is far larger than his left
Tshokwane	Southern Kruger	sadly he has broken both tusks, but remains a very impressive bull
Phelwana	put down in 1988, due a septic poachers wound	
Nhlangulene	died of natural causes at age 55 (1987), his tusks when measured would have put him into the Magnificent category, but being very elusive – he was never studied	

Conservation Status

Currently the **IUCN** lists the animal as vulnerable, and **CITES** has imposed a **world-wide ban on the trade of all elephant products**. South Africa does not agree with this at all, as we have so many **surplus elephant**, that the yearly culling of between **300** and **600 animals** had taken place for many years in our largest reserve. This reserve, the **Kruger National Park**, is also sitting on a stockpile of ivory valued at around 25 million rand (**\$ 4 500 000**). Culling was halted in the mid 1990's due to pressure from international animal welfare groups. Alternative to controlling population numbers such as contraception and relocation have failed.

The latest information in this regard may be derived from a recent news report:
Courtesy of EcoAssist:

Planned sale of ivory called off

The sale of a 60-ton ivory stockpile by SA, Namibia and Botswana has been stalled after the potential buyer failed to meet conditions attached to the transaction by the Convention on International Trade in Endangered Species (Cites).

This means that the offer, which was expected to be concluded in May, could only be returned to the Cites agenda at the end of the year. SA cannot directly negotiate any deals with Japan without Cites giving the nod.

Pieter Botha, deputy director general of environmental affairs and tourism said Japan and other south-east Asian countries had failed to provide Cites with baseline information for a six-month period on their monitoring of illegal elephant killings a prerequisite for the sale.

Ivory sales can only be approved if the ivory was from legal government stocks, if it was sold to a "respectable" country with required legislation and domestic trade controls, and if all proceeds were invested in elephant and community conservation

At present, The KNP is reviewing it's elephant management policy.

The following is an extract from the KNP Scientific Services website:

Preamble

For approximately three decades the Kruger National Park (KNP) maintained its elephant population at a level of approximately 7 500 animals, removing all 'excess' individuals during an annual 'culling' operation. This policy gave rise to considerable controversy and debate, and in a public meeting held in May 1995 in Midrand the South African National Parks (SANP) undertook to suspend this policy pending a thorough review. This review has now been completed and resulted in a radically changed proposal which promotes a system of zoning. In these different zones a range of elephant impacts can be achieved for the benefit of biodiversity in general.

The proposed new policy

We cannot manage the KNP solely for the benefit of elephant, but we do acknowledge that elephant are a significant component of the KNP system. We have to allow some form of population flux in the elephant population, because the effects of such fluctuations benefit the broader biodiversity of the Park. Some areas are opened up by high elephant numbers knocking down trees, thus promoting grassland and herds of zebra, wildebeest and others. Some other areas become woodland due to low elephant numbers and this benefits many species of birds, reptiles and a host of other groups. So we need a *range* of elephant impact, but have to dampen the extreme highs and lows which in our modern world work against many animal and plant populations.

To enable these biodiversity-benefiting processes and achieve a broad range of elephant impact, we are proposing a zoning system which essentially divides the KNP into six huge zones. Two of the zones are botanical reserves - one north of Punda Maria and another around Pretoriuskop - where a range of rare or endangered plants need the benefit of the doubt regarding elephant impact. The remaining four zones are all of equivalent size and cover the rest of Kruger. Two of these are high impact zones where elephants will be allowed to increase their numbers in an unrestricted manner for an indefinite period lasting several decades, and the other two zones are low impact areas where elephant numbers will be actively reduced through live capture or culling (and contraception as a future possibility).

We have developed - in collaboration with many of the very best wildlife managers and academics this country has - a series of indicators or indices which we will use to monitor elephant impact. Each of these indicators, whether they be baobab trees, percentage of canopy cover in an area, species and age structure of plants in an area, and several others, has been assigned a percentage which they will be allowed to change before we will get concerned. These are so-called TPC's, short for **Thresholds for Potential Concern**.

Major, substantial change will be allowed to occur to these indicators before a TPC is reached, and the reason for this is precisely so that a significant amount of fluctuation in environmental conditions can be achieved, in simulation of natural cycles of elephant impact.

Once a TPC has been reached, and investigation shows we cannot allow further change to occur without incurring loss to some component of biodiversity, then the high and low impact zones will be switched.

Elephant numbers will then be reduced in what were previously the high impact zones, thus allowing a "recovery" phase for the vegetation, and elephants allowed to increase in the previously low impact zones. Preliminary computer modelling shows that these switches will probably need to occur at anything between 30 and 100 year intervals.

By using this zonation system we build in flux in elephant impact, broaden the range of ecological niches available in the KNP, more closely approximate natural ecological processes than we have in the past, but avoid the gross devastation which would surely accompany total disregard for population increases.

Some people say we should adopt a completely "hands-off" approach, simply let the elephant population grow and a Tsavo episode repeat itself here as the elephants will die down naturally to levels in keeping with environmental resources. That would represent gross disregard for other species, and after all this Park is for *all* species, not just elephants. One has to ask yourself, following a Tsavo-type crash (\pm 65,000 elephant starved to death in 2 years) , would an entire generation of visitors (because that is how long it would take for the Park to recover) want to visit a devastated landscape and very few elephant in sight?

Our mission statement includes a commitment to these tourists, in equitable balance with our biodiversity aims.

Prepared by Dr Leo Braack

General Manager: Conservation Development Kruger National Park

Of interest are the elephant numbers in the Kruger National Park:

Year	Number	Nature of estimate	Source
1903	0	Estimate	Stevenson-Hamilton 1903a, 1903b
1905	10	Estimate	Stevenson-Hamilton 1905
1908	25	Estimate	Stevenson-Hamilton 1909b
1925	100	Estimate	Stevenson-Hamilton 1925
1931	135	Estimate	c.f. Pienaar, van Wyk & Fairall 1966
1932	170	Estimate	Stevenson-Hamilton 1932
1936	250	Estimate	Stevenson-Hamilton 1936
1937	400	Estimate	Stevenson-Hamilton 1937
1946	450	Estimate	Sandenberg 1946
1947	560	Estimate	c.f. Pienaar, van Wyk & Fairall 1966
1954	740	Estimate	Steyn 1958
1957	1 000	Estimate	Steyn 1958
1962	1 750	Fixed-wing survey	Pienaar 1963
1964	2 374	Helicopter count	Pienaar, van Wyk & Fairall 1966
1967	6 586	Helicopter count	Pienaar 1967
1968	7 701	Helicopter count	Pienaar 1968
1970	8 821	Helicopter count	Pienaar & van Wyk 1970
1975	7408	Helicopter count	Joubert & Pienaar 1975
1980	7 454	Helicopter count	Joubert 1980
1985	6 887	Helicopter count	Joubert 1985
1991	7 470	Helicopter count	Whyte 1992
1992	7 632	Helicopter count	Whyte & Wood 1993
1993	7 834	Helicopter count	Whyte & Wood 1994a
1994	7 806	Helicopter count	Whyte & Wood 1994b
1995	8 064	Helicopter count	Whyte & Wood 1995
1996	8 320	Helicopter count	Whyte & Wood 1996

The CITES **ban has appeared to discourage poaching** of elephant in Central Africa, where the problem was at its extreme. This is primarily due to a **drastic reduction in the price of ivory**, from **\$ 100 / kg** [2.2 lb./.] to under **\$ 5**. In South Africa however, with excess elephant, we are continually attempting to have the status of the African Elephant **downgraded** to permit the trade in some if not all elephant products.

A very hotly contested debate, in this avenue is that instead of culling the elephant, why should we not **sell** the animals themselves? This is a viable option, and many elephant are sold annually. However there are **not a great deal of locations** that can support elephant, and supply always without exception exceeds demand. One further solution is population control using **contraception** or birth control methods. On-going research and field trials in the Kruger National Park have thus far been **prohibitively expensive** and have **failed dismally**. The research continues.

Lastly, there are two other Southern African countries to watch closely as regards their elephant populations: **Zimbabwe** and **Botswana**.

Both countries are heavily overstocked with elephant from an ecological carrying capacity, taking into consideration the scientifically accepted ideals for elephant management.

Zimbabwe has an estimated **40,000 elephant** (although no recent, reliable data is available).

Botswana, has an incredible **80,000 elephant** ! The effects of these vast numbers is easily seen. Most notably along the Chobe river. In 1990, the Chobe exhibited \pm 60 Km of thick riverine forest, habitat and home to many species including bushbuck, nyala, suni and other duiker. Today in 2004, almost nothing of this riverine forest remains, the river frontage has been reduced to a bare strip of dust and stumps. Will this habitat recover? Prominent ecologists think not, at least not for the **next 500 years**.

Why elephant control is necessary and practised, as well as the topics of biodiversity and habitat management are explored further in Module # 10.

Elephants have the **second longest potential lifespan** of all terrestrial mammals after man. This is primarily due to the fact that elephants **only have six molar teeth during their life**. When the last is either worn away or lost, they **cannot feed and thus they die**. This occurs at around **65 years of age**.

We hope you have enjoyed this component.

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