

THE LION - *Panthera leo*

INTRODUCTION:

To most, the African Lion needs no introduction. It is known as the 'King of the Jungle', and has earned its place as one of Africa's 'Big 5'.

SIZE: Shoulder height (m) 1.2m (f) 1.05m; weight (m) 180kg, (f) 130kg.

COLOUR: Tawny, but varies from almost silvery yellow to reddish brown with paler undersides (female belly yellowish to almost white); yellow to black mane. Faint, leopard like spots on young sometimes retained into adulthood.

MOST LIKE: Unlikely to be confused with any other animal.

HABITAT: Variety of habitats, from open savanna to semi-desert; never in forests.

DOMAIN: Northern Namibia, Botswana, northern & southern Zimbabwe, northwestern & central Mozambique, Mpumalaga and Limpopo, The Kruger National Park, and the Kalahari Gemsbok National Park of the northern Cape.

Lions are the top predator in any African ecosystem in which they occur, and are the largest of the African carnivores. With their large, muscular, tawny bodies and characteristic manes, they are unmistakable, and are treated with awe by prey species as well as most visitors to game reserves, whether it be their first visit or their fiftieth

Lions, like other cats, adapt well to their particular circumstances. They select their prey from the spectrum of available animals, but, given a choice, they exhibit a preference for large ungulates

SOCIAL:

The lion is the only permanently social, or group-living cat: all other cats are solitary. Similarly to elephants' society, the lioness and her offspring are the focus of the lion society: female lions in a pride are usually related. Female cubs born to pride lionesses usually remain bonded for life to the group, whereas males invariably do not figure as permanent members. If a pride becomes too large, one or more males, with one or more female groups will break away to form their own pride.

Lions use urine spraying or marking the soil with their paws to mark their territory. Territories vary in size according to how large the pride is and the concentration of game. Both male and female lions have a dominance hierarchy. Females outnumber males, usually by 2 to 1. Several different lions, both male and female may be a leader of a pride. Male cubs are ousted at puberty (about 18 months) and they have to find their own kills. The two adult males that usually accompany a pride, occupy their positions by right of conquest: in some cases they may be brothers or cousins, but often they are unrelated. Their reign is generally short-lived however, and they are ousted by younger, stronger males during noisy battles of succession. Although these battles are often fierce, serious injuries are rare, and the ousted males often become nomads, wandering over large distances. By rolling over on his back, a male lion can avoid aggression from a stronger opponent. Although is uncommon for males to fight to the death, occasionally, defending males are fatally wounded or suffer disabling injuries, leading inevitably to a lingering death. Lionesses fight each other as often as the males do! Sub-adult lions leaving their natal prides usually adopt a nomadic existence. There are, however, several restraints on their movements: they tend to follow game, and they avoid settled prides who often attack nomads. Nomadic groups may consist of lions of both sexes, they may be members of the same litter, or different litters from the same pride. Sometimes nomads meet up with other lions and form a pride; most nomadic lions are now confined in protected areas: if they venture out of these areas they are often killed. It is only in remote areas such as the woodlands of Central Africa, the Kalahari Desert and the Kaokoveld where nomadic lions have enough space to roam

HUNTING:

Most hunting takes place under the poor light conditions of early evening or dawn, and during the night. During daylight when prey animals themselves are better able to see, the lion is at a disadvantage, as its hunting technique depends on stalking within range of its prey. African Lion have little stamina, and will usually get up close to the prey before charging. In about 10% of kills, the prey is ambushed. The lion's final charge is usually made from as close as 10 metres, seldom exceeding 20 metres. Lions do not always hunt in a group and single lions account for about 50% of all kills. They are generally fairly lethargic: they exert themselves for short periods of time and then spend long periods of slow movement or relaxation. Despite their apparent obliviousness to their surroundings during resting periods, they can become aggressive quickly if suddenly or unduly disturbed. It is commonly believed that lions attack mainly sick, wounded or old animals: this is not actually the case, and animals in their prime are often taken, with the notable exception of buffalo bulls in their prime, or large male giraffes. Lions are opportunist hunters, and, after a careful stalk, will take the closest animal regardless of its age, sex or condition: they do not test their potential prey for weaknesses, like other predators such as wild dogs do. Although Lions usually kill their own prey, they are known to scavenge food from other predators, and even eat carrion when unable to hunt.

If suitable prey is available, lions eat every 3 to 4 days, but can go without food for more than a week. They average about 5 to 7kgs meat daily, but can consume about 25% of their body mass if necessary. An adult lion will kill in the region of 15 animals per year. The norm is for African Lions to kill only enough to sustain themselves, but they have been known to kill excessively in the case of prey animals that are weak or young lions that go beserk.

The seasons will influence the age of the prey taken: during the summer months when certain species experience seasonal birth peaks, more calves will obviously be killed. Most antelope have an adult sex ratio that favours the female, as males usually stand their ground longer, and are thus more vulnerable to predation. Young bachelor males and older males that have been ousted from territories are also more likely to be killed by lions, as they occupy less favourable areas. African Lions hunt primarily by sight. Although visual cues will trigger the hunt, their sense of smell and hearing will assist in alerting them to the whereabouts of their prey. Herbivores are untroubled if lions are visible, but get agitated when they smell or hear them without being able to locate their position, or when being stalked.

REPRODUCTION:

A lioness in oestrus is closely followed by the males of the pride. When the female is ready to mate, an indication is given by her making advances to the male of her choice. The mating pair are reluctant to go off hunting with the other pride and usually remain behind. Interestingly, a pride will generally accept an outside lioness that is on heat! A single male generally remains the consort of an oestrus lioness throughout the course of her mating period, although some lionesses may mate with more than one male. It is known that approximately one third of all mating sessions result in pregnancy, there is a high likelihood that multiple matings by a lioness may result in a litter where the cubs have different fathers. This could be simply to increase the genetic variation of her cubs, or to foster collective bonding within the pride, by the prevention of strong pair bonds forming, as well as greater pride cohesion: for example, males from the same pride often take over another pride together, which is more significant if they are closely related. After a gestation period of about 110 days, the lioness will retreat to a secluded area to give birth. The average litter comprises of three cubs but this may vary from one to six in rare instances. The cubs weigh no more than 1.5 kg at birth: they are blind and barely able to crawl, and therefore helpless against predators. Their coats are fluffy and marked with dark rosettes - a phenomenon which is theoretically traced back to some primaeval leopard-like ancestor.

Lion cubs have characteristic long hair on the back of their necks, which is supposedly also to emulate honey badgers, which are known for their incredible ferociousness despite their small size. These early days are fraught with danger and the cubs are vulnerable to attack from hyaenas, leopards and black-backed jackals. Elephant and buffalo have been known to trample them to death and there are records of them having been killed by safari ants. For the next six to eight weeks, the cubs are kept hidden from the pride: during this time the mother returns to suckle them, and spends a fair amount of time with them. At two months old they weigh approximately four kilograms and usually already have all of their teeth. They are then carried to the pride for introduction and inspection: first the pride male/s, and then the rest of the pride. The female mostly keeps her cubs away from the pride males, and is also cautious around strange females: she is very protective over them, and communicates with them via short humming calls.

The mother lioness will not introduce her cubs to the pride if cubs already established with the pride are over 3 months old, as any female in milk can be suckled by any cub, and large cubs will put her own cubs at a disadvantage in obtaining milk. From six months of age, the male cubs tend to grow faster than the females and at one year, their behavior is consistent with that of adult males. They begin to grow a mane by 10 months, and take an interest in the hunt by one year of age, gradually learning to master hunting and killing techniques, and are independent at two years old. Grooming plays an important part in bonding of the cubs and their mother, as well as the rest of the pride, and also is important in keeping each other clean. A vital element in the life of cubs is play: play involves stalking, chasing and ambushing, and is important for preparing them for hunting.

If cubs are present during a period when a pride male is ousted, their lives are at risk. The new pride male may kill and even eat the small cubs of his predecessor. By practicing infanticide, the new pride male ensures the early return to oestrus of their mother, and a mating opportunity for himself, as well as the survival of his genes within the pride.

CONSERVATION:

There is probably no other species whose distributional range has shrunk over historical times to the extent shown by the lion. At one time the distribution of the African Lion was throughout much of Europe, Asia and Africa. They are now extinct in Europe, and only about 190 individuals remain in north western India where their conservation status is seriously threatened. There are no longer lions north of the Sahara, and their range in the Southern African subregion has also shrunk considerably. Lions are great wanderers, and so sometimes turn up in areas where they have been unknown for many years.

Today most interactions between humans and lions are limited to encounters in game reserves. Lions have been recorded stalking game from behind the cover of cars and buses and will settle down to rest in the shade provided by the vehicle. 'Park' lions offer visitors the opportunity to watch them for hours doing what they do best - lying around doing nothing and looking majestic. Most game reserves require that vehicles stick to the roads or tracks so should the lions wish to avoid people they can easily do so. In safari - hunting areas lions are wary of humans and will avoid contact wherever possible. In remote areas stock-killing lions used to be fairly common, and were dealt with in a variety of ways. This has however confined the African Lions distribution to remote, uninhabited or protected areas and there is little incidence involving livestock killing.

Although not as prevalent today as in the past, man eating still occurs, largely as a result of the increase in human population and the decline of game. Lions will take people sleeping outdoors at night should they encounter them, as well as dogs, goats, pigs and other livestock. Many of the lions that have become man-eaters have been found to be old or injured, and no longer able to hunt their normal prey effectively.

Managing lion populations is a dilemma, particularly due to sub-adult lions being driven out of the pride and becoming nomadic, which sometimes takes them out of the reserve onto surrounding tribal land, where they take to killing cattle, and usually have to be destroyed. To avoid this type of situation these sub-adult lions are culled inside the reserve before they venture out. This impacts on not only the long term pride structure, but also the genetics of the lion populations.

Various alternative solutions to culling have been explored. Consequences of human interference with the natural system has significantly altered the predator - prey balance. Erecting fences around a park in order to reduce wildlife - livestock conflicts, will have major impact on the migration routes of the lions' natural prey, such as zebra, wildebeest, springbok etc. These migrations are ancient and were determined largely by rainfall and the availability of water. The loss of dry season areas of game concentration in more arid reserves is often countered by drilling boreholes inside the park, providing permanent water in areas which were normally seasonal. Lions exploit these plentiful waterholes as additional places of ambush, and the lion population may then flourish.

Research into the use of contraception has also been conducted. Synthetic hormone capsules implanted in the lioness slowly release a drug into the bloodstream, inhibiting the oestrus cycle and

THE LEOPARD - *Panthera pardus*

INTRODUCTION:

The Leopard is the largest spotted cat in Africa, and is a powerful symbol of the wild places of earth: it is solitary, beautiful, graceful, strong, agile and cunning. Leopards are the most widely distributed and successful of the world's large cats, inhabiting more diverse habitats than any mammal, with the exception of man and certain rodents.

Leopards vary in size depending on location: leopards of the western Cape are smaller than those found in the Kruger National Park. It is thought that the woodland leopard is small and dark compared with its counterpart from more open country, but it is difficult to validate this, as size is affected by nutrition.

No two leopards are exactly alike, either in their markings or their background colour, but they do have black spots on the limbs, flanks, hindquarters and head, with rosettes on the remainder of the body. The tail is over half the length of the body, and is either spotted or rosetted. The underparts of both the body and tail are slightly lighter in colour than the upper-parts, as this helps with light deflection in terms of camouflage.

Although smaller than a lion, the sleuthlike leopard is often more feared. It is fiercer, braver and very intelligent: a perfectly streamlined killing machine with exceptional hearing, good eyesight and sensitive, extra-long whiskers which help it avoid obstacles in the dark. The body is compactly built and cat-like, the head massive, and the strong, very sharp, curved claws are fully retractile. The 'dew claw', which is the claw of the first digit on the front feet, is used to hold large prey. The claws and first digits on the front feet do not mark in the spoor. The leopard is also a remarkable athlete, capable not only of swimming across rivers, but also of leaping onto rocks up to 3 m high, carrying prey as heavy as itself, as well as hoisting heavy carcasses into the branches of trees. Leopards are adept climbers: they climb even smooth barked trees with ease, and move with confidence among swaying branches.

SOCIAL:

Leopards are usually nocturnal, although they are occasionally active by day, and can sometimes be seen during the day lying up in a tree. They shelter during the heat of the day, either in trees, caves, or in the shade of rocks: in arid regions they often crawl into disused aardvark burrows for shade. Trees and rocks double as vantage points from which they survey their hunting terrain, as well as avoiding other predators such as lions or spotted hyaenas, or, their most dangerous competitor, another leopard. They are solitary, although breeding pairs will sometimes be seen together, and mothers with cubs may be sighted. Leopards are sometimes spotted basking in the early morning sun. Unlike other large predators, they are not found only in game parks, and many still roam in the wild, usually on or near farmland. Leopards are territorial, and defend their territories against individuals of the same sex. Males and females mark their territories by spraying urine and by leaving warning claw marks on tree trunks at the edges of their territories. Despite these avoidance mechanisms that have been developed, fighting among male leopards is fairly common, and can be severe. The home ranges of female leopards are smaller than those of the males, and male home ranges can overlap with that of more than one female. In areas of prey abundance, where there is a high density of leopards, the territories of males may overlap considerably, and in such cases the leopards usually actively avoid contact, using the 'common area' at different times. The size of the territory depends on the habitat, and ultimately on the amount of food available within that habitat and particular area. Leopards move at a slow, casual walk, which can quickly turn into either a bounding gallop or a brisk trot if necessity demands it.

HUNTING:

The leopard is a highly effective hunter: they make full use of any cover available, such as trees, bush, long grass, and dappled shade, from which to stalk their prey. They will even ambush prey by dropping on to them from the strategically placed branch of a tree. They do not engage in long chases: leopards are stalkers and pouncers, and hunt by sight, sound and smell. When stalking, they crouch with their body held close to the ground and the tail horizontal, while they locate the prey primarily using their acute night vision, freezing whenever the prey looks around alertly: then they burst out with a focused fury. Leopards are totally adapted for hunting: they have close-set eyes for binocular vision, so they can accurately judge distances, and they often observe prey from a high vantage point before beginning their painstaking stalk. They then give a relatively short chase (normally less than 30 m) and kill their prey by throttling, or, less frequently, a bite to the back of the head, which severs the spinal column.

The teeth are impressive, and deadly efficient: their canines deliver the killing bite, and tear through rough hide, while the razor sharp molars and rasping tongue make short work of flesh. Prey is often dragged up into a tree to prevent it being snatched by hyaenas, lions or jackals, although in areas such as parts of Namibia where hyaenas have not occurred for decades, leopards do not expend extra energy by hauling the carcass into a tree, and simply eat it on the ground.

Leopards also kill small prey, such as mice or birds, by swatting them with a paw. Certain prey may be disemboweled and the entrails buried, and birds will usually be carefully plucked before eating: leopards seem to dislike fur and feathers, and get rid of them by shaking their head vigorously; they often also pluck out a section of fur from a mammal carcass with their teeth before eating. Leopards often kill more than they require immediately, and hide their kill either in a tree or a hole, returning later to finish it. They will scavenge carcasses if available. The predator isn't always the victor: adult wildebeest, zebra, giraffe, sable antelope and gemsbok have all successfully driven off leopards while protecting their young, and while leopards can attack baboon at night, they usually don't attempt it during the day, as the rest of the baboon troop usually come to the defense of their troop member, and drive off the leopard, or rip it to pieces. It is a common myth that baboons and bushpigs form the major prey of leopards: while these animals are eaten by leopards, they usually form a small percentage of their diet.

Leopards do not tolerate other predators very well, and often chase competing species. There are records of leopards killing cheetah and hanging them up in trees without feeding on them, and also of leopards eating other leopards that have been killed in territorial disputes.

When wounded, cornered, or suddenly disturbed, leopards can become exceedingly dangerous, and there are many cases, particularly among hunters, of people being seriously hurt or killed by leopards.

REPRODUCTION:

Leopards have no particular breeding season. A female in oestrus will attract attention by calling, and will leave scent marks on trees and bushes: she will also often wander out of her normal home range. Male and females form temporary associations, and an oestrous female may be mated by several males within a short space of time. Usually 2 to 3 cubs are born, in caves, hollow trees, holes in the ground, or any suitable, sheltered place. The mother leopard moves her cubs to a new shelter every two or three days, carrying them one at a time in her mouth. Leopard mothers groom their cubs by licking and nibbling at them, and they groom each other and their mother. The cubs stop suckling and start eating meat after about 3 months: they are led to the kill to eat until about 10 months, when they join the mother on the hunt.

Leopard cubs learn by copying their mother's behavior, and they usually kill their first impala by 11 months, although they can kill small animals like mongooses or rodents from about 4 months. The mother may bring dead or live prey to her cubs, which they attempt to pounce on, and learn to manipulate with their claws. When moving with cubs the mother leopard's tail is curved upwards, showing the whitish underside which may act as a guide to the young in the tall grass. Predation on leopard cubs, particularly by other leopards and spotted hyaenas, is very common, and it is rare for more than one or two cubs from a litter to survive to independence. Cubs become independent after a year, although siblings often remain together for a few more months, and some cubs do remain with their mothers for almost two years. After cubs have become independent, affectionate reunions between mother and cubs can still occur.

CONSERVATION:

Leopards are by no means endangered although as with many other large mammals, their numbers are reduced compared with what they once were. They have a long history of conflict with man, largely due to the fact that humans' domestic stock have been killed by leopards. Once leopards have eaten domestic stock and become aware of the ease with which they can kill it, they tend to return for more. 'Problem' leopards have been moved in the past to game reserves, but they have incredible homing instincts, and usually travel long distances to return to the same farm where they were trapped.

It is also unwise to bring new leopards into other leopards' territories: this is probably another reason why the newcomers do not remain long in their new homes. In addition, there are genetic differences associated with different areas, and moving leopards around may not be a good idea genetically: the solution now is to rather shoot leopards that habitually eat domestic animals. Although leopards are still fairly widespread, certain leopard populations are being severely impacted upon, not only by irate farmers and pelt hunters, but largely due to the reduction of their habitat, and some countries have conservation strategies in place for leopards, in order to maintain genetically viable leopard populations in different localities.

THE ELEPHANT - *Loxodonta*

INTRODUCTION:

The African Elephant is the largest living land animal (measured at shoulder): huge, impressive and majestic beasts, they have earned their place as one of Africa's 'Big 5'. They are also highly intelligent gentle giants with a strong sense of family and herd, and a complex social structure. The lumbering gait of this towering, tusked monolith of the African veld, is one of the truly unforgettable sights in the arena of southern African wildlife. Usually a gentle, mild-mannered vegetarian, the elephant is quite capable of killing other animals such as antelope, and even hippopotamus, in its pursuit of water.

Elephants are very vocal creatures: they rumble, squeak, trumpet, gurgle and chirp, as well as communicating with body language, such as by shaking the head, spreading the ears, raising the trunk etc. Much of their communication (vocalisations) cannot be heard by humans, as they make low frequency rumbling noises that can travel for kilometers. Elephants have an acute sense of smell, and communicate by smell and touch - often one elephant will place its trunk into another's mouth in order to greet it or reassure it in moments of stress.

Elephants also often raise the trunk in order to test the air. Compared to the size of their heads, elephant's have small eyes with long lashes, and their sense of sight is fairly poor.

SOCIAL:

Elephants are incredibly social animals: they form strong, long-lasting bonds within their herd. They adopt orphaned calves, help injured elephants and work together. They have surprisingly complicated behavioural patterns and interactions. An injured member may be helped to its feet and supported by other herd members: if it is badly wounded, it may be vigorously defended by the herd, with even the calves taking part. Although elephants are normally peaceful individuals, they can be aggressive and extremely dangerous, especially if they are sick or injured. Females in groups with young are particularly unpredictable, as are males in musth.

Family groups are the basis of elephant society, and consist of herds of females. A group can be as small as 3 or 4, or as large as 25 or more, although in times of plenty several family groups may join together to form large herds, sometimes containing hundreds of individuals. Herds are matriarchal: females spend their lives with the herds into which they were born, and the social structure of the herd revolves around the cows, who wield the power in elephant society.

Males are only associated with female herds when they are very young, or briefly during mating. Young males remain in the herd with their mothers until they reach puberty, which is usually between the ages of 10 and 13; they then either remain alone ('lone bulls'), or form small, loosely associated 'bachelor herds' together with other young males .

From birth to about 5 years old, young elephants grow, develop bonds with other elephants in their family group, and learn about their environment: where to locate food and water. Young females also learn to associate with calves, which not only helps prepare them for motherhood but strengthens their relationship with the calves mother. It seems that one of the most important reasons for elephant herds is the protection and nurturing of the young, as, unlike adult elephants, calves are highly vulnerable to predation, particularly by lions, and have no means of natural defense. Very young elephants walk underneath their mothers' bellies, between their legs. The mother, as well as other females within the herd, defend them vigorously

FEEDING:

African elephants spend about two thirds of their time feeding, and consume about eight percent of their body weight daily - generally about 200 - 250 kg of food each day, depending on their body weight. They often uproot small trees and severely damage large ones in their quest for food, thereby modifying their habitat.

Their wide distribution is possible due to their amazing versatility and variety of diet: elephants can feed on everything from roots to treetops - they can dig out bulbs and roots, reach up and break off branches of trees, or simply knock the tree down to get at tasty titbits: their diet varies from tiny herbs to strips of bark: they also eat grass, seed pods, wild fruit, and flowers: in fact anywhere from 100 to 500 plant species.

This versatility is largely possible due to the trunk, which results in an ability to exploit a variety of food sources that is unique among land animals. Apart from food, elephants require large amounts of water, will cover vast distances in order to reach it, and will drink at least once a day, and sometimes several times a day. They also require salt and other minerals, and often dig for minerals in rich soil: they also prefer water that contains large amounts of minerals, and will drink selectively from different waterholes. Whenever they reach water, which may be daily, or in drier areas only every third or fourth day, they bathe, either spraying themselves or lying down in the water. Sometimes they submerge completely, with only the tip of the trunk showing. They are very relaxed in water, and move through it either by swimming or by walking on the bottom while using their trunks as a 'snorkel'.

Elephants deposit large amounts of dung each day, which plays a major role in the recycling of nutrients. Many seeds not only get dispersed by elephants, but have a greater chance of successful germination after passing through an elephant gut.

REPRODUCTION:

Male African Elephants usually do not breed until they are 30 years old or older, and able to compete with other adult bulls. Adult bulls do not seem to become permanently attached to any particular family group, but are incredibly social and do seek out companionship. Usually one to several adult bulls (depending on the size of the herd) will be associated with a herd, but the bulls do not become part of a particular herd: they move from herd to herd seeking females in oestrus.

Adult bull elephants go through musth, a specific reproductive condition, about once a year, and this state may last a few days, three months or longer. The musth glands, or temporal glands, swell and secrete a liquid: this can often be seen as a thick secretion running down the side of the elephants face. There is an increase in the male sex hormones during this time and the bull may become aggressive and unpredictable; the search for a mate is also intensified. Musth bulls often issue a specific low rumble, which is often answered by a female calling back. Older bulls may actually cause suppression of musth in younger bulls. There is evidence to suggest that musth is a reliable indicator of good condition, as African elephant bulls in poor condition do not come into musth, and wounded bulls may drop out of musth. Cows usually begin reproducing between the ages of ten and twelve. They produce a single calf at four to five year intervals, and may continue breeding until about fifty. A large family group can include four generations, and cows do not usually become matriarchs until they are 40 or 50. Elephant calves are usually born during the early summer. A central bond is that between mother and calf, and mother elephants care for their young longer than any other animal, with the exception of humans and some whales. Pregnancy lasts nearly two years, and at birth the calf weighs roughly 100 kg, and stands just under three feet at the shoulder. Calves can continue to drink from their mothers (while also eating vegetation) until the age of three years; in some cases 5 years, although the norm is 2. If a nursing mother dies, her calf may be adopted by other nursing mothers. During its first year a calf will remain close to its mother, only becoming more independent during its second year. Much is learnt by watching - young elephants will place their trunks in their mother's mouths in order to find out what she has been eating. In addition to feeding it, the mother elephant protects her calf, assists it over obstacles, and squirts water and dust over it. Elephant calves are very playful and vocal, squeaking, squealing and barging into each other.

CONSERVATION:

Once 5 - 10 million elephants roamed across Africa - in 1979 the population was 1.3 million, and in 1989 elephant numbers had dropped to 600 000. This large drop in numbers during the eighties was largely due to poaching. The conservation status was highlighted at the CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) meeting in October '89 where the African elephant was placed on Appendix I of CITES, which led to a world-wide trading ban on ivory and other elephant products. Appendix I means a species is threatened with extinction and can be traded only if permits are obtained by the importers and exporters, and cannot be traded for primarily commercial purposes. There has been pressure from various countries to lift the ban over the years, but at the CITES meetings of '92 and '94 the ban remained in effect. A large part of the world ivory trade has collapsed, and there is now a very limited market.

New pressures and problems are now facing elephant populations, such as the increased demand for land, and a change in land-use patterns due to human overpopulation and desertification. In some areas elephant populations have stabilized and now pose a threat to certain habitats. This has led to the controversial issue of elephant culling. As pressures from increased land use intensify, combined with the on-going threat of poaching, a major concern is the affect on elephant family groups and social structure: old elephants with big tusks are becoming a rarity, and many old matriarchs on which the family groups depend have died. Elephant groups are now led by younger, less experienced animals who may not know where to go and how to survive when food and water are scarce, and are also more likely to encounter problems with people.

BUFFALO - *Syncerus caffer*

INTRODUCTION:

Buffalo varying from small, reddish small-horned individuals living in forests to the more widely known large, dark, heavily-built savanna buffalo with large, heavy horns. The low-slung horns, particularly those of the males, are massive and develop heavy central bosses, which are covered by hair until the male is 2 - 3 years old. Buffalo are heavily built, thick-set animals, with large legs to support their heavy bodies. In spite of their bulk, they are capable of speeds of up to 55 km/ hr over short distances.

When wounded, buffalo become very aggressive and with their curved horns held high, they charge, lowering their horns at the last moment to fling their tormentor into the air. Nature lovers are often amazed at the intelligence and cunning of buffalo. An alarmed herd, threatened by a pride of lions, will most often go into a defensive semi-circular formation, males on the perimeter facing outwards, protecting the females and calves within.

Cape Buffalo are troubled by skin parasites such as ticks, and red-billed oxpeckers are a common sight on buffalo; as many as 12 may be seen perched on a buffalo at any one time, pecking out ticks, which form their staple food. The oxpeckers also warn the buffalo of approaching danger.

Much of the communication of Cape Buffalo is in the form of body language: the hierarchy between males is maintained by threatening displays.

SOCIAL:

Buffalo can be found in herds of up to several thousand individuals. These herds are relatively stable associations, with the smaller herds forming into larger ones temporarily. Buffalo herds move seasonally in search of adequate grazing and water. There may be family cohesion of females within the herd: family ties in the males do not last beyond three years of age. Old and young bulls may leave the herd and form small bachelor herds, but the two age classes are usually found apart. There is an established hierarchy, both within bachelor herds and large herds, and old bulls often get harassed, which can result in them becoming solitary. The linear hierarchy is maintained primarily by threat behaviour rather than by serious fighting although if this doesn't prove a deterrent then fighting will occur. Fighting consists of the opponents charging each other and growling, then lowering their heads to take the impact on their horns. Due to their small size, bachelor herds can exploit small food niches such as occur along lake shores, whereas large herds need to have very large home ranges. Herds tend to move to water in the early morning and late afternoon. Buffalo are inquisitive, and will often approach vehicles to examine them. If a herd is disturbed the individual buffalo will often stampede in unexpected directions. They are considered one of the most dangerous of the African species to hunt, and wounded buffalo have been known to double back and ambush their attackers.

FEEDING:

Cape Buffalo have the most efficient digestive system for digesting fibrous food of any of the ruminants. While they will feed on fresh, new grass such as occurs in freshly burnt areas, they also readily eat old grass, and can adequately cope with digesting it. Their habit of eating old grass and trampling it helps to open up these areas to other species by enabling new growth on them. During the rainy season, when food is abundant, Cape Buffalo become selective feeders, and prefer red grass, buffalo grass, small buffalo grass, and finger grasses. Cape Buffalo are sensitive to heat, and move into the shade during the heat of the day. Much of their feeding takes place at night.

The mouth parts of Cape Buffalo are adapted for feeding on long grass, as they pull the grass into their mouths using their tongues, and bite stalks off by moving their lower incisors against the dental pad in their lower jaw.

REPRODUCTION:

While most male Cape Buffalo reach sexual maturity between 3.5 and 5.5 years old, they are not usually allowed to breed until they are 8 - 10 years old. Females, however, can have their first calf when they are 4 - 5 years old. Most buffalo calves are born in the summer months, and usually either during the late afternoon or just before dawn, when the herd is resting. A single calf is born. The new-born calves can follow the herd a few hours after birth: if the herd moves during this time the mother and calf may be left behind temporarily. Cape Buffalo calves are sometimes hidden in thick undergrowth while the mother grazes nearby.

The bond between mother and calf is fairly strong, and they communicate via croaking calls from the mother and bleating by the calf. Cape Buffalo calves continue to suckle until they are about 15 months old, and can remain with their mother until the age of 2. Calf mortality is fairly high, as they are targeted by predators.

CONSERVATION:

Like many other large mammals, Cape Buffalo were once much more widely distributed than they are today. In the southern part of their range, the southern part of South Africa, they used to occur right along the Cape south coast to the west: today they are not found in the Cape province at all, except for in the Addo Elephant National Park. They do occur in specific parts of many African countries.

The rinderpest epidemic that swept through Africa in the 18th century almost exterminated the Cape Buffalo, but the species has remarkable powers of recovery, and they have repopulated many areas.

During the wet cycles Cape Buffalo numbers build up, only to decline during dry spells, as they cannot adapt very well to dry conditions, and they find it hard to find enough food when the grass is short. Cape Buffalo can have a profound effect on the grass cover in reserves, and it has been necessary to cull large numbers of them in the Kruger National Park when their numbers have built up considerably.

Disease and climatic factors which affect their habitat are the most serious factors affecting buffalo populations, as predation has only a very minor effect.

Foot and mouth disease has had a major impact on Cape Buffalo, particularly in Zimbabwe, and at the present time bovine TB is a major problem in the southern regions of the Kruger National Park, and will have a major impact on the buffalo population there.

White Rhinoceros : *Ceratotherium simum*

INTRODUCTION:

Despite their names, both the black and white rhinoceroses are grey. White rhinos are square-lipped, and are grazers; black rhinos have a hooked, prehensile upper lip and are browsers.

LENGTH OF HEAD AND BODY (MALES LARGER): 3.6 - 4.2 metres

HEIGHT AT SHOULDER: 1.5 - 1.85 metres

MASS: 2 300 - 3 600 kilograms

LENGTH OF FRONT HORN (NORTHERN RACE): 95 - 200 centimetres
(SOUTHERN RACE): 95 - 101 centimetres

The White Rhinoceros is not white in colour; its name is derived from the Afrikaans / Dutch word "weit", meaning wide, and its manner of feeding has adapted to grazing short grass with a mouth similar to that of the business end of a lawnmower. This animal, with its territorial behaviour and rather slow rate of breeding, make it a poor colonist, and it is very slow to expand its range. White rhinos have a barrel-shaped body and short, thick-set limbs. The head is elongated, and the horns are continuously growing: one horn in front, and a shorter one behind. The skin is thick, grey, and prominently folded on the front of the shoulders and on the upper part of the hind limbs.

White rhinos require areas of short grass, water for drinking and in which to wallow, adequate bush cover, and relatively flat terrain. These conditions are usually met in wooded grasslands. They do not have incisor teeth and instead use their hard lips to crop grass. They drink regularly and are dependant on its availability

SOCIAL:

White rhino occur in small groups consisting of a single dominant or territorial bull, subordinate bulls, cows and their offspring. Territorial bulls occupy clearly defined territories which they defend against other bulls. Territories are marked by urine spraying and defecating along the boundaries, and although territorial males rarely fight and tend to avoid one another, they do indulge in trials of strength, which may include horn clashing, to settle disputes and confirm social position. After a dispute, the defeated male may stay and feed in the defended area as long as he displays submissiveness, ceases to spray urine or scatter dung, and stays out of the proprietor's way. The quality of food and the density of animals will establish the size of a feeding territory, especially in restricted areas such as a park or reserve. During full population density, a male's feeding territory is approximately 2 sq. km ($\frac{3}{4}$ sq. mile). Males remain subsidiary in society from when they mature sexually, at the age of around seven, for about another three years until they are able to displace an existing bull and inherit his territory and females.

Females too, have clearly defined feeding areas, that are much larger than those of the males. The boundaries overlap freely, and mothers with calves are very tolerant of each other's presence. They can range 10 sq. km (4 sq. miles) and pass through a male's territory without being challenged. White rhino rest and feed alternatively for a few hours at a time, day and night, in cool weather. Rhinoceroses need to wallow and drink at least every two to four days and if the water in the vicinity has dried up, they will walk as far as 10 km (6 miles) from their home range to find it. Water often gathers in the hollows on a hardpan surface, and the short grass turf around it sustains grazing.

Flies become particularly troublesome at certain times of the year and rhino will tend to avoid damp, shady places which would otherwise attract them, and seek out exposed, breezy areas in an attempt to keep the insects at bay. When water is in short supply and wallowing and grooming are kept at a minimum, they will roll in the dust and rub themselves against posts, partly to control skin parasites, but also as a means of marking territory by leaving flakes of skin bearing individual odour.

Whether walking, trotting or grazing, white rhinoceros keep their heads down in the same position and will only raise it when they become alarmed. They are able to maintain speeds of 40 km (25 miles) per hour over short distances and they are surprisingly agile; one apparently climbed a gate 2 metres (6 ft) high to escape from temporary captivity.

HORN:

The record is 2 m (6 ft 6 in) but such huge horns are very rare nowadays. A front horn measuring 108 cm (3 ft 7 in) is considered unusual, and few rhinoceroses reach a sufficient age to grow horns of this size. The female has a longer, thinner horn than the male. From regular contact with the ground during grazing, the front horn usually has a smoothly polished and slightly flattened leading surface. Horns are also used for digging and they do sometimes get torn off: if so they will regenerate.

Rhino horn actually consists of very tightly compacted tubular filaments, which are very similar to hair, and is the cause of the near-extinction of the species, largely because it is considered an aphrodisiac by certain cultures.

COMMUNICATION:

Although primarily a territorial function, dung piles have another significance. It seems that a passing animal is stimulated to defecate by the sight or scent of a mound of dung, as if it were a specific social duty. These trail side mounds can become quite tall because they are not kicked about by their contributors: dung-kicking is a privilege reserved for the dominant male in the territory. Also, the mounds serve as an indication of the population density in the area and they are distributed all over the territory until there are about 15 every 1 sq. km (0.4 sq. miles).

Vocalisations are used for direct communication, and the white rhino makes a wide range of sounds. Territorial males are usually silent, occasionally snorting when another moves nearby. They also pant, as a sign to join up or to maintain contact, shriek to prevent attack, or puff when alarmed. Rhino calves squeal when they want protection.

On the very rare occasions when fighting breaks out, it becomes a rather noisy affair as the threats and submissions rise through their various levels of intensity. The wails of a courting male are often accompanied by a sound called 'hic-throbbing' and although its significance is unclear, it is thought to have something in common with the very deep abdominal growls of elephants, which are known to be transmitted for long distances through the ground and are detected by other elephants through their feet.

In addition to vocalizations, rhinos communicate using a variety of signals via body language, such as a flattening of the ears as a warning, advancing, which in its most serious form is a full charge, as well as staring and horn-prodding. Side-rubbing may help cement bonds within the group. Head-flinging amongst the young is an invitation to play.

White rhino have poor sight but acute smell, and can rotate their ears independently to locate sound. They respond readily to moving objects.

REPRODUCTION:

Females mature sexually at the age of around seven. After coming into oestrus, they will pass through male-held territories and spray urine, advertising their condition and inviting courtship from the dominant males. Mating takes place all year round and a female with a calf will come into oestrus six to eight months after giving birth.

Bulls can detect when a female is pro-oestrus, will actively prevent females from leaving their territories during this time, and will drive off any subordinate males that appear to show interest in the female.

Courtship takes between five and twenty days to complete, and is a slow and cautious ritual. Males have been reported to attack young calves who at six months or more, are distinctly possessive as they are still nursing and will continue to do so for at least another six months. The gestation period of the white rhinoceros is 16 months and although twins have been seen, a single calf is the rule. The mother will spend a few days in solitude with her calf before the close presence of other rhino will be tolerated: during this time the calf is very unsteady on its feet. When the mother and calf move together, the calf usually walks in front. The calf is weaned at about a year old, and separates from its mother when it is 2 or 3 years old.

A number of options will be open to the young rhino. Some will attach themselves to a childless female whilst others will find a companion, usually of the same age and sex, sometimes forming a group of up to five young rhino.

Female white rhinoceros breed at two or three year intervals and their life span is between 40 and 50 years. A female can produce ten or eleven calves if allowed to live out her natural life: compared with other ungulates, this is a very slow rate of reproduction. However, in the natural state, the white rhinoceros is immune to predation and this immunity produces a very low natural mortality.

CONSERVATION:

There was a rapid decline in numbers of the white rhino between the years 1872 and 1877 in southern Africa. No trace was found of the white rhino in the region of the Upper Chobe River in 1879, although a few were later found between the Umniati and the Hanyane Rivers, in what was then known as north eastern Mashuna Land, and is now western Zimbabwe. The White Rhinoceros was thought to be extinct in 1892, just 75 years after the explorer Burchell had discovered it.

However, a few individuals had survived in the valley of the Umfolozi River in Natal. They were re-discovered in 1897 and the South African government went on to declare the valley a preserve, which later became joined as the Hluhluwe-Umfolozi game reserve: these, along with St Lucia, are therefore the oldest game reserves in Africa. The population increased steadily, and the first official white rhino census in 1930 revealed that there were only 120 individuals in the Umfolozi Reserve, and 30 on adjacent ground: by 1960 the number had increased to 700. Since then rhino numbers in the Hluhluwe and Umfolozi areas have increased substantially, and in 1989 1 240 were relocated out of South Africa, and 2 199 were translocated within South Africa.

Black Rhinoceros : *Diceros bicornis*

INTRODUCTION:

To this day there remains some uncertainty about whether the two species are different enough to be separated into two distinct genera. There is also disagreement over the number of subspecies of black rhino.

LENGTH OF HEAD AND BODY: 3.0 - 3.8 metres

HEIGHT AT SHOULDER: 1.4 - 1.8 metres

MASS: 996 - 1362 kilograms

LENGTH OF FRONT HORN: 50 - 135 centimetres

The black rhinoceros is separated from the white by its ecological requirements. As a browser, it is able to colonise areas of rugged hilly terrain where grass is scarce, at an altitude of up to 2 700 m (9 000 ft). It will avoid open grassland frequented by the white rhinoceros, and very dense vegetation, preferring the edges of wooded areas. Ideal black rhino habitat is adequate shrubs and young trees up to about 4 m high, including well developed woodland or thicket in which to shelter during the heat of the day. Originally its range covered the southern third of Africa, northwards between the east side of the Rift Valley and the east coast, as well as a band of open woodlands stretching from the Horn of Africa to the west coast, south of the Sahara. They manoeuvre food into their mouths with the aid of their prehensile upper lip, bite shoots off with their premolar teeth, and grind food with the massive molar teeth. Black rhino feed on an unusually wide variety of species, and they are flexible feeders, as they vary their diet according to availability.

SOCIAL:

Unlike white rhinos, black rhinos tend to be solitary: the only stable bond is that formed between mother and calf, but even that is fairly temporary, lasting only until her next calf is born. Other associations, such as male-female associations or between a number of individuals of the same age, are very transitory. They are not strictly territorial but they do tend to remain with a specific home range, which may overlap with the home ranges of other members of the population. The size of their home ranges differ according to sex, age and the type of habitat, with immature animals usually occupying larger areas than adults. The only time they gather in groups is temporarily to wallow: five is the largest party usually seen together, though groups of as many as 13 have been recorded.

Although aggression between bulls is normal, they tend to actively avoid contact: sometimes serious fighting does occur, however, particularly over females in oestrus. Snorting and pawing are the prelude to a series of short charges, which will usually stop about 6 m (20 ft) short of impact. However, during a time of ecological stress in East Tsavo, before the drought in 1960/1, all the rhino were found to be wounded and some were killed in fights. This was evidently abnormal behavior produced by conditions of extreme hardship. During the day they retire to the shade to sleep, either standing or lying with their legs curled under them. Black rhinos sometimes sleep lying flat on their sides; a position never adopted by the white rhino.

The black rhino seems to take a particular delight in crashing through cover; unlike the other animals of the bush in that it has no regular predators as an adult, it has no need to move stealthily. Like the white rhino the black rhino sprays urine and dung; it also leaves a scented trail consisting of flakes of mud and pieces of dead skin by rubbing against trees: this helps to communicate its presence, and possibly its identity, to the next rhinoceros who comes along.

Feeding in the morning and evening and sleeping in the heat of the day, the species has become largely nocturnal. This is most likely the result of natural selection, which has eliminated the more diurnal individuals which were most likely to be shot. Wallowing plays an important part as it helps to lower body temperature, offers protection against biting insects when the mud dries, and helps with 'rhino sores', which are areas of cracked and often inflamed skin which occur most commonly in the hollow behind the elbows of the front legs.

REPRODUCTION:

Black rhinos breed at any time of year. When a cow is in oestrus the bull approaches carefully, and they then spar with their front horns or nudge each other with the sides of their heads. Although most females respond violently to the male's first approaches, and she may attack him occasionally, no serious or vicious fighting takes place during courtship.

Gestation is between 446 and 548 days: the average seems to be 460 days or about 15 months. Females breed only every two to five years because of the time required to rear the calf. The newborn calf weighs between 25 - 40 kg, which is about four per cent of its mother's weight. Calves can walk and suckle three hours after birth, and are vulnerable to trampling. Unlike the white rhinoceros, black rhino calves walk behind their mothers. As they grow older they have to lie down to suckle: they usually suckle for about a year. The mother and calf communicate with each other via vocalizations, and the mother will defend her calf vigorously, even from lions. Calves are rejected by their mothers when they are between 2 and 4 years of age, either when the mother is pregnant, or immediately after the birth of her new calf.

Black rhino are usually fully grown at about seven years of age and they reach sexual maturity at about six. Their life expectancy is not accurately known, but black rhino are said to live for up to 40 years; this figure has been estimated by some to be closer to 50 or 60 years .

CONSERVATION:

The chief factor which makes the black rhino more dangerous than the white, is its habitat. It is more likely to be taken by surprise in thick bush than the white rhino in open grassland, and is able to charge at up to 50 km (30 miles) per hour, and attack and obliterate any identified object with its horn. People on foot in the bush are extremely vulnerable and many cars have been severely damaged by startled animals. In addition to habitat differences, the black rhino is known to be more wary, more temperamental, and more aggressive than the white rhino.

The greatest enemy of the black rhinoceros is mankind. Because its favoured habitat is fertile and well watered, it has come into conflict with humans long before the arrival of Europeans in Africa. Its uncertain behaviour made it an alarming neighbour to cattle-herders and its feeding habits did not coincide well with crop farmers. The demand for land for settlement is increasing and with it the call for control or the elimination of all rhinoceroses. The black rhino is endangered, but increased protection and anti-poaching measures have saved it from extinction. A total of 185 black rhinoceroses have been translocated from KwaZulu-Natal reserves.