

## **A Guide to the African Wild Dog (30 June 2011)**

**The African Wild Dog's scientific Latin' name is '*Lycaon pictus*'** (meaning painted wolf) – but this name, like all the other most commonly used names, is misleading. The African Wild Dog is only a very distant relative of the Grey wolf (*Canis lupus*) and of the Grey wolf's modern descendent – the domestic dog (*Canis lupus familiaris*).

- 1) It is not a domestic dog gone wild despite being called 'African Wild Dog', or 'African Hunting dog', or 'Cape Hunting Dog' or simply 'Wild dog'.
- 2) It is not a wolf despite its Latin name *Lycaon pictus*. The wolf (*Canis lupus*) is the direct ancestor of both ancient and modern domestic dogs. It is not a direct ancestor of *Lycaon pictus*.
- 3) Unlike the domestic dog and the wolf, Wild Dogs do not bark or howl. Their characteristic vocalisations are – a bird-like twittering and a submissive whining call and a distinctive plaintive sound, known as a “hoo-call”, given when dogs are separated from their pack.

**For convenience the species will be referred to here by its most commonly used name 'Wild Dog'**

**Evolution** – The Wild Dog and the wolf did have a common ancestor about 3 million years ago. The genus *Lycaon* first appeared about 1.5 million years ago and is now found as a free living species only in Africa

About 2 million years ago the ancestors of the animals that we now call the Wild Dog and the Wolf followed different genetic pathways, with the first wolves being domesticated, and known as the domestic dog, in Asia, from where it spread throughout the world reaching Africa in the company of human immigrants by about 7000 years ago.

It is thought that humans first used 'domesticated wolves' some 1 million years ago to help them in hunting and in guarding them and their livestock. The wolves that became the first domestic dogs did so because their social behaviour allowed them to accept, not only unrelated wolves, but also humans as their 'leaders'. Wild dogs will not do so as their social behaviour is quite different and so they cannot be domesticated and, due to genetic differences, Wild Dogs, unlike the Ethiopian Wolf (*Canis simensis*), cannot inter-breed with domestic dogs.

**Range** – Wild dogs now occur naturally only in Africa. They are not territorial i.e. they do not actively defend a defined area of land, but have large diffuse

home ranges (e.g. in Serengeti up to 1,500 sq.kms. and in Selous of between 150 – 850 sq.kms.).

For 3-5 months of each year when pups are born and raised they remain and hunt in a more restricted area around their den site. When the pups are old enough to join the adults, the pack can range widely. Many wild dogs emigrate from their natal pack in single sex groups when 18 months -3 years old and often travel very long distances searching for mates e.g. from the southern 'Serengeti' plains in Tanzania to areas in and around the Masai Mara National Reserve in Kenya, some 100 - 120km to the north.

**Pack Structure – a 'pack'** is defined as a collection of dogs of both sexes **containing at least one potential breeding pair.** Single sex 'groups' do not constitute a pack

The simplest pack consists of a single male and an unrelated female but packs usually consist of a number of closely related males and a number of females unrelated to the males but with the females usually related to one another, often sisters, and sometimes with their mother who is the dominant ( alpha) female in the group.

**Alpha status -** In wild dogs the **alpha male retains his alpha status only until he or his alpha female mate dies,** then a male from the youngest cohort (age group) present will take over as alpha male without any overt aggression but then the pack will split into single sex adult groups **a process known as Pack Dissolution or Pack Fission**

All the females will leave the pack (together with the **alpha female if she is the survivor and she, unlike her former alpha male partner, will retain her alpha status** over related younger females. The males will usually remain in their former pack's home range. The females will often travel long distances looking for new males but the males will await the arrival of new females. **Thus there is no close in-breeding.**

If the alpha female dies and the alpha male survives and younger males are present he loses his alpha status but remains with the other males (and any pups) in the group as a very subordinate but valuable member – he knows the territory, how to hunt and where to find water and how to avoid potentially dangerous areas such as woodland areas with high lion populations.

**How to identify alpha pair in a wild dog pack –** when the alpha female urinates, the alpha male will urinate over (cover) the same place raising a hind leg to do so. Such behaviour, known as **Raised Leg Urination (RLU)** is only shown by alpha males. Being able to distinguish the alpha air is especially useful when observers encounter a pack for the first time.

**Beta Status** - Same age but subordinate sisters of the alpha female often undertake secondary emigration to obtain breeding opportunities. Likewise subordinate same age or older brothers of the alpha male in a pack will also sometimes leave a pack to find breeding opportunities. Sometimes a subordinate male and female from the same pack will undertake secondary emigration together and often breed successfully even without 'helpers' . .

**Single sex groups** - result either due to the emigration of usually 18 month to 3 year olds of both sexes from their natal pack , or the result of an existing pack splitting into single sex groups of adults when one of the alpha dogs in a pack dies (see 'Alpha status' above).

**The size and composition of a wild dog pack often changes significantly over a 12 month period as pups are born and older dogs born in the pack emigrate. Thus, a successfully breeding wild dog pack is a dynamic entity with often rapid fluctuations in pack size and composition.**

**Some packs have a more complex composition** as sometimes young females first ' shadow' and then may join an existing pack. Such young immigrant female(s) may be related to either one of the alpha dogs in the pack, in which case they help to provide food for any pups in the pack to which they are related.

These new 'females' are accepted as pack members by unrelated younger males in the pack who view them as potential mates, but they will not be accepted by the alpha female. In such cases this sometimes results in serious fighting between the alpha female in the pack and the alpha female in the younger, unrelated female immigrant group, but pack males take no part in this.

In other cases a small group of adult males will adopt unrelated male pups that they encounter. In this case when the male group meets one or more females one of the older males becomes alpha for the first breeding season, **but in subsequent years the now mature alpha male pup in the adopted group will take over as alpha male and mate with the existing alpha female.** The former temporary alpha male remains in the new pack together with the other older males, all as subordinates. This is a strategy that benefits the alpha female who retains her status and reproductive potential with a younger male and also benefits the temporary alpha male who has the security of remaining in a viable pack.

### **A 'Young Male' protocol**

**In wild dog society a unique 'young male is top dog' protocol has been identified resulting in the social behaviour of wild dog being very**

**different from that of domestic dogs and wolves and the basic reason why wild dogs cannot be domesticated.**

**This probably unique protocol in mammal behaviour has important implications for pack longevity and hence for the conservation, management and captive breeding and any subsequent release of groups of this highly endangered species.**

In each litter an alpha male and female in their respective single sex groups soon emerge.

The existence of the young male protocol means that in a wild dog pack, when one of the alpha pair in their pack dies, or when two cohorts of males emigrate together from their natal pack, or when a male pup is adopted by unrelated adult males, a male from the youngest cohort present will be the alpha male in the group and in any subsequently formed pack

**Temporary male alpha status** - If, at the time of the death of one of the alpha pair, the youngest age group (cohort) are pups then a sexually mature older male brother (from a previous litter) can act as temporary alpha until the younger alpha male pup is sexually mature and takes over as alpha male in the pack. His older male brother will then relinquish his temporary alpha status without overt aggression.

The diverse range of circumstances in which this 'Young Male' protocol has been found to operate in free living packs in contrasting habitats and in captive colonies suggests that it is a basic genetically determined instinct.

**Denning season** – this varies depending on location and habitat, e.g. woodland or open plains, where the wild dogs live. The mother must have a plentiful supply of water during lactation and the whole pack needs a good supply of locally available prey near the den site.

**In Selous and Ruaha wooded habitats the dogs breed in the dry season** when prey species are concentrated around the water sources.

**In Serengeti the dogs breed in the wet season** when there are plenty of temporary water supplies and when the wildebeest and other migrant herbivores gather on the plains where they produce their offspring, thus providing an easy source of food for the wild dogs.

**Pups** - are usually born once a year. Litter size varies, usually between 4–12 pups.

If there is more than one breeding pair in the pack then the **pups of the alpha pair will be born first. The beta pups are born after the alpha's pups and**

**the alpha female will take over the pups of the beta** which are born in another den, often some distance away.

The alpha will sometimes carry the beta's pups to her own den. It is unlikely that this results in harm to the pups and reports that alpha female will deliberately seek out and kill any of beta's pups is ill-founded.

**This 'take over' of beta's pups is to the advantage of the alpha female** because she will potentially have more helpers to feed her next years litter. The gap between birth of alpha and beta litters varies. If the age gap is just a few days or weeks, the beta female will have to suckle both alpha and beta pups and to remain at the den as 'baby sitter' and so have to beg for food from the returning pack after hunting. The natural priority for the pack is to feed any pups so the beta female has to actively solicit for food to be regurgitated to her. She does so by adopting very submissive postures and whining.

Despite claims to the contrary **it is possible for a single pair of dogs to raise a litter of pups on their own** even when their den is close to an active hyaena den.

**Pups remain below ground in the den until 3 or 4 weeks old.** Then they will begin to emerge to explore, suckle and to feed on meat regurgitated to them by the rest of the pack until they are old enough to be taken to the kill where they are given priority of feeding. The rest of the pack stand back and wait their turn until the pups are finished feeding and so guard the pups and prevent hyaena, lions, jackals or vultures taking over the kill.

When the pups are about 3 months they are old enough to leave the area of the den and join the pack to roam widely in search of prey but, when the pack hunts, the pups are usually left behind to await a pack member returning to take them to the kill.

**Hunting – the ritualized pack behaviour or “Wind-up” prior to hunting** is often started by a subordinate dog which, being lower down in the feeding hierarchy (see below), has probably had less to eat than the others. Such dogs will approach resting pack members with ears back and with crouching gait. This generates general excitement and activity in the pack mainly involving submissive behaviour, bird like 'twittering' calls, urination and defecation. Soon all the pack members are involved and the excitement ends when the pack quickly leave their resting area to start a hunt. If the pack has fed well in the previous hunt this new 'hunt' some hours later may simply result in play and exploration or a 'walk about' session rather than a serious hunt.

Young dogs start to hunt when they are about 12 months old but do not become expert hunters until they are about 18 months old. It is soon after this that they will need to leave their natal pack to find breeding opportunities of their own.. A single dog, even a lactating female, can kill prey up to the size of a male

Grant's gazelle on its own but for larger prey (e.g. wildebeest, zebra, giraffe) they usually hunt co-operatively.

**Wild dogs can chase at speeds of up to 60 km.per.hour.** Hunting usually takes place early in the morning and late in the afternoon when it is cool and they also hunt at night when there is good moonlight.

**Wild dogs are able to eat their prey immediately even after a long chase because they have the ability to allow their body temperature to rise** and do not need time to recover before they start eating. This ability differs from some other predators (e.g. cheetah) which need a recovery period, during which they 'pant' to reduce their body temperature before being able to feed and by so doing, may lose their kill to scavengers.

**Prey species** – in Selous and Ruaha – mainly impala. In Serengeti – wildebeest when available during the migration, otherwise Thomson's and Grant's gazelle.

**Feeding hierarchy – there is no fighting over food as there is a strict feeding order.**

**Pups have priority at the kill** - when old enough to be taken to the kill they will be allowed to feed first whilst the rest of the pack stand around guarding them and the kill. However, the dog(s) which make the kill will bolt as much as possible before the pups arrive.

**Alpha female and yearlings are second, the older subordinate adult dogs are last.**

Sometimes the pups will take up to 2 hours to feed on the kill whilst the yearlings and any others in the pack will stand around watching and guarding the kill. If the kill is small then by the time the pups are finished there may be very little left for the others. If so, those lowest in the feeding hierarchy, will leave and make their own kill.

**If the pups are too young to go to the kill then it is the yearlings and alpha female who will have priority at the kill** – they will eat as much as they can and race back to the den to **regurgitate to the pups**. Dogs can regurgitate 'fresh' food up to 12 hours after a kill.

The pups will 'ask' (solicit) for food, as will the alpha female if she has remained at the den.

Whilst the pups are being fed at the den not only do the yearlings have priority at the kill but they are the most keen and efficient helpers in feeding the pups by bringing food back from the kill and regurgitating it to the pups before returning again to feed.

Although the beta female at a den may also try to solicit the dogs to regurgitate for her they may not do so and she will have to rely on her partner the beta male or leave the den and make a kill herself. It is thought that being low down in the feeding hierarchy is an incentive to the beta pair to leave the pack.

When pups are old enough to feed at a kill, the wild dogs approaching 2 years old become lower in the feeding hierarchy and this may encourage them to leave their natal pack not only for breeding opportunities but for more food.

**Dispersal of wild dogs from their natal pack in same sex groups when they are aged between 18 months – 2 years old.**

When **both** the alpha pair are alive, and a new litter of pups are present, the 'yearlings' (males and females) when aged 18 months – 2 years old must leave their natal pack if they are to have breeding opportunities of their own because they cannot breed with their mother or father or brothers or sisters.

**Eventually unrelated yearling groups of the opposite sex will meet up and a new pack is formed.** As the alpha status in pups of both sexes in their litter is determined when still young and is retained, as soon as the unrelated group of young dogs meet up to form a new pack the alpha pair is instantly formed and identifiable (see RLU).

Note: in the case of females dispersing together with their mother after the death of the alpha male (their father) then their mother retains her alpha status and so mates with the new young alpha male.

### **Aggression between packs and single sex groups**

There is little evidence of chivalry (i.e. overt concern for the welfare of females) in male wild dog behaviour. Males will help to feed the breeding female(s) and her pups in a pack and defend the pack from predators. However, when two packs meet and fighting results it is the females that fight one another, sometimes inflicting serious bite wounds, but the males take no part and do not defend their pack's females from attack by the unrelated females.

Sometimes a group of young dispersing females attack the alpha female in an established pack and, again, the pack males do not interfere. This may be because the attackers in this case are younger females that may displace the mother of the young males born in that pack.

This gives some of the young males in the pack the possibility of immediate breeding opportunities, whilst their father, the former alpha male, and perhaps his subordinate brothers in the original pack will be able to remain as vital

'helpers' in the new pack from which the former alpha female and her female offspring have been expelled.

Such fights between females can sometimes lead to fatalities. Likewise if a group of emigrating young males encounter a small pack they may attack and displace the alpha male and take over the female(s) in the pack. Older males are sometimes killed during such encounters, or fail to survive alone after being injured..

### **Other facts**

1) There is **no** case of a human being attacked by a wild dog. Pups and yearlings are very curious and will come close to and even shelter in the shade beneath tourist vehicles but will back off if alarmed by sudden movements or noise.

2) The **coat pattern** of each wild dog is different so it is possible to identify each individual.

3) Wild dogs have only 4 digits on the foot, no 'dew claw'.

4) Females but not males have been known to survive on their own for at least 3 years, one observed hunting and feeding successfully even when in the company of spotted hyaena .

### **Why are wild dogs so rare and endangered?**

#### **They should not be rare because:-**

1) wild dogs are very successful hunters

2) they co-operate together as a group and have the ability to rapidly increase their numbers due to large litter sizes 1.

3) they avoid lions but will live in close proximity to spotted hyaena with no evidence of predation by hyaena on wild dog pups or prey stealing being a problem.

4) It is frequently reported that wild dogs are particularly vulnerable to canid diseases via contact with domestic dogs but there is no data basis for this claim. Wild dogs are no more susceptible to diseases than are other carnivores in their area but disease outbreaks have occurred when the local domestic dog population has been experimentally vaccinated against rabies only or vaccinated with a combined mixture of Canine Distemper, Canine Parvovirus and rabies vaccines as around the Serengeti Mara post 1991



5) they live and thrive in areas with local traditional pastoralists and their unvaccinated domestic dogs

### **So why are they so rare?**

We do not know for sure why they are not more common but:-

1) they naturally live at low densities and need large home ranges and in recent times they have lost large areas of their former habitats as have the local Maasai pastoralists .

2) Until the 1970s they were considered as vermin and persecuted by hunters and even by National Park rangers and ‘conservationists’. Today they may be persecuted when they go outside the protected areas especially when they are seen as a threat to domestic livestock. .

### **3) Known causes of significant wild dog mortality are:-**

i. Road kills by tourist and other vehicles driven at high speed on main and bush roads particularly after nightfall.

ii Snares set by poachers although not intended for wild dogs

### **4) Human disturbance at wild dog dens during denning season –**

i. **Vehicles approaching too close and possibly over the den holes causing collapse**

and

ii. **Walking safaris to visit dog dens are** is an other factor now being linked to poor pup survival. Such disturbance is known to result, in some cases, in pups being moved to other dens and so exposed during transfer to predators or becoming lost. The pathways made through the bush for access to the dens make den sites obvious and easy for predators to access, particularly lions known to be a major problem for wild dogs denning in woodland habitats.

**5) The experimental vaccination of free living wild dogs** against rabies in the Serengeti-Mara ecosystem 1988-90 was followed by the extinction of the entire study population by mid 1991 whilst an unvaccinated non study population persisted and persists to date in adjacent Maasai pastoralist areas outside the protected wildlife conservation areas.

### **Adverse effects of invasive research on wild dog study populations**

**In Serengeti-Mara** - a statistically significant correlation has been found between invasive ‘handling’ of wild dogs and reduced longevity in Serengeti-Mara following the introduction of routine blood sampling and radio-collaring of study packs and groups post 1985.

The extinction of the entire study population in both sectors of the ecosystem followed an attempt to mass experimental rabies vaccination of the then study packs in 1989-90. The only confirmed cause of death was rabies.

**In Kruger National Park** - a dramatic population decline took place between 1995 - 2005 in the most intensively studied only free living population of wild dogs in South Africa.

The decline post 1995 followed a period of particularly intensive invasive 'handling' of both adults and pups for radio collaring and implants plus blood and tissue sampling for genetic research..

Such invasive research ceased in 2005 when the population was at an all time low since observations had began in 1989. The results of a recent photographic demographic survey to determine numbers present in 2008-9 is still awaited (June 2011).

**In Selous Game Reserve** - In Selous males, particularly older large males, so probably including a high proportion of alpha males, but few females, were selected for radio-collaring and blood sampling (known as 'handling'). In this study it is claimed that in a typical mating period several males suffered bite wounds on the face and neck but no injuries observed due to fighting over food.

It is also reported that alpha male status in a pack changed as often as three times a year but alpha females were replaced less often usually after being evicted from a pack by immigrant females.

**Such frequent changes in alpha male status within a pack has not been reported in any other wild dog study population including Serengeti where wild dog behavioural research began in the mid 1960. This highly unusual aggressive behaviour reported in the Selous study is a cause for concern.**

It is known that alpha dogs can lose their status following injuries in inter-pack clashes or following wounds after being caught in snares or injured in traffic accidents .

A possibility is that the physical 'handling' of alpha males (and females) precipitates aggression directed towards the recently 'handled' individuals. This perhaps results from changes in their physical appearance following the attachment of a large radio collar, with or without an external aerial , and loss of the dog's 'natural' scent now replaced with 'foreign' smells of humans and their chemicals.

Were the claimed frequent change in alpha status and associated injuries observed amongst the males in Selous packs the result of handling induced physical harassment /aggression towards these alpha dogs?

The possibility is that handled dogs lose their high social status after being selected for radio-collaring and blood sampling by researchers.

As a pack's longevity is dependent on the survival of both of the founding alpha dogs the loss of one and the resulting Pack Dissolution that would follow could explain the very short life of individual study packs and the low pup survival as in Kruger National Park.

**This possibility has not been investigated or even considered by researchers using highly invasive handling 'tools' on one of the most highly endangered and charismatic species of canid in Africa.**

*'The adverse effects of tagging may be subtle and important, although difficult to detect'* (Tuytens Macdonald & Raddam (2003)

*' . the resolution of one question remains imperfectly ragged, despite exhaustive attention, and that is whether handling or vaccinating wild dogs had inadvertently contributed to their demise in the Serengeti-Mara ecosystem'* (David Macdonald, Chair of the Canid Specialist Group, in Preface to: - IUCN, Species Survival Commission, Canid Specialist Group (CSG), Status Survey & Conservation Action Plan, 'The African Wild Dog' (Woodroffe et.al.1997) ).

*"It is likely. that in many studies any adverse effects [of handling] are either unnoticed, perhaps because they are rare, or, more likely, because they are not reported"* (Laurenson 1992).

*" from our results and PVA models presented previously (Burrows et al 1995 ,Ginsberg et al 1995b), it is difficult to determine whether the extinction of the Serengeti wild dog population is more likely to be due to chance alone (Ginsberg et al 1995b) or to invasive research methods (Burrows 1992)."* (Cross and Beissinger 2001).