Background Information and Species Management Guidelines for Namibia's Rare and Valuable Wildlife

African Wild Dog

Lycaon pictus

Introduction

This booklet provides an overview of the African Wild Dog in Namibia. It is an additional booklet to an original series of five booklets reviewing the conservation status and management guidelines of three large mammals and two groups of ungulates in Namibia, and the first to cover one of our five large carnivore species. The other booklets are on savanna elephant, hippopotamus, buffalo, three large antelopes (roan, sable and tsessebe); and four water-associated grazing antelope (southern reedbuck, common waterbuck, red lechwe and puku).

This booklet summarises the research findings of the Wild Dog Project 2008 Report – a 5 year technical report prepared by Robin Lines of the Wild Dog Project. The project is facilitated by Namibia Nature Foundation (NNF) and funded by Tusk Trust, MTC, NedBank Go Green Fund, Save Foundation and Painted Dog Conservation Inc. The original report, together with project updates and further technical information, can be downloaded from www.nnf.org.na/wilddogproject.htm. An accompanying poster is also available from NNF for a quick overview of these issues.

The conservation and management issues and ideas presented here are from a Namibian perspective; however, to fully achieve their aims, many of them require considerable co-operation and collaboration with neighbouring countries in the region. Many of the management actions recommended for the African Wild Dog would have similar benefits to other rare or high value species.

Contents

Biology

Taxonomy

Class Mammalia
↓
Order Carnivora
↓
Family Canidae
↓
Subfamily Caninae
↓
Species *Lycaon pictus*

The African Wild Dog is the only species in the genus *Lycaon*. Genetic studies of the southern and eastern African population show gradual genetic variation across the population, and no distinct subspecies are recognised across the region. Additional research is needed to assess subspecies status from remnant western, central and north-eastern African populations.

See page 5 for information on the species' distribution and numbers.

Physical Description and Behaviour

African Wild Dogs are large but lightly built canids, with long, slim legs and large rounded ears. The scientific name *Lycaon pictus* is derived from the Greek for "painted wolf". It is the only canid species which doesn't have dewclaws on the forelimbs. The colouration of the coat is distinctive but highly variable, with a combination of irregular black, yellow-brown and white blotches on the back, sides and legs. Southern African individuals tend to be more brightly coloured than their duller Eastern African cousins. Each animal's coat colouration is unique, like a human fingerprint, and this can be used to identify individual animals. Colouration of the head and tail is more consistent: almost all individuals have a yellow-brown head with a black 'mask', black ears and a black line following the vertical centre line of the forehead, and a white tip to the tail.

Typical measurements	Males	Females
Average body weight (kg)	28	24
Maximum body weight (kg)	36.5*	26.5
Average height to shoulders (cm)	85	80
Average body length (cm)	120	95

** heaviest on record. Caught, collared and released at Tsumkwe in 2008*

The length of the coat varies but it is generally short on the legs and body and longer around the neck, giving a shaggy appearance. There are four digits with claws on each foot and, in most cases, the second and third toe are partially fused. Males are slightly heavier than females and conspicuous by their external testes and penis sheath.

African Wild Dogs are cursorial predators*, chasing prey to exhaustion at speeds of up to 65 km/h. They can maintain 45 km/h for 5 km, although most chases are generally within 1-2 km. No other African mammal can match their combination of speed and endurance.

African Wild Dogs are highly social pack animals; hunting, breeding and dispersing in close cooperation with other pack members. Hence packs, rather than individuals, are arguably the most appropriate measure by which to count African Wild Dog populations. Packs are dynamic and may fluctuate rapidly in numbers. Packs average 8 adults and yearlings but may be as small as a pair, or may number over 30 adults, yearlings and pups. A typical pack consists of an alpha (dominant) male and female which dominate breeding, their siblings and several related pairs of subordinate females and males.

** cursorial: adapted to, or specialised for, running*

Adult female, Tsumkwe, Namibia

Through specialised cooperative hunting and killing strategies African Wild Dogs can subdue prey far larger than their body size would indicate; however, their dominant prey species are typically the more common small to medium-sized antelopes in the area e.g. steenbok and duiker, but also species as small as hares and as large as adult kudu and wildebeest. Packs will chase larger species but rarely kill them. Their killing method of disembowelment is often wrongly interpreted as cruel, when in fact it is highly efficient and specialised, dispatching the prey quickly. Scavenging of carrion is rare. African Wild Dogs have the highest success ratio of hunts to kills of all large carnivores in Africa, exceeding 75% in many studies. They also have the highest bite force relative to their weight of any living carnivorous mammal. As a result of cooperative hunting each dog has a higher foraging success (measured as kg killed per km of chase) than if they hunted alone.

Studies across six different protected areas found that home range sizes average between 560 and 750 km^2, but in semi-arid habitats such as the north-east of Namibia home ranges can exceed 3,000 km^2, with significant home range overlap between packs, excluding a core breeding area which each pack breeds and defends vigorously from other packs.

African Wild Dogs have a complex communication system incorporating olfactory, visual and auditory systems. They have 5 main calls, ranging from a low frequency ‘hoo’ call used for long distance location to a high pitched ‘twittering’ call used to communicate excitement within packs.

Adult male, Botswana

Habitat

African Wild Dogs are habitat generalists and in the past were present throughout all African ecosystems except the Congo Basin rainforests and true deserts. They have been seen above the snow line at 4,500 m on the slopes of Mount Kilimanjaro and hunting oryx across the Namib plains after periods of good rains, but populations seem unable to maintain residency in areas with < 200 mm rainfall. This precludes much of the far western areas of Namibia apart from those areas within the ephemeral river systems that sustain higher densities of suitable prey all year round.

Reproduction and Population Dynamics

The alpha female and male pair dominate breeding, but on occasion the beta female may breed. Pup survival in a beta litter is low due to the boisterous play of the alpha female's larger pups and the likelihood that the pack will abandon the safety of the alpha female's den to resume normal ranging behaviour.

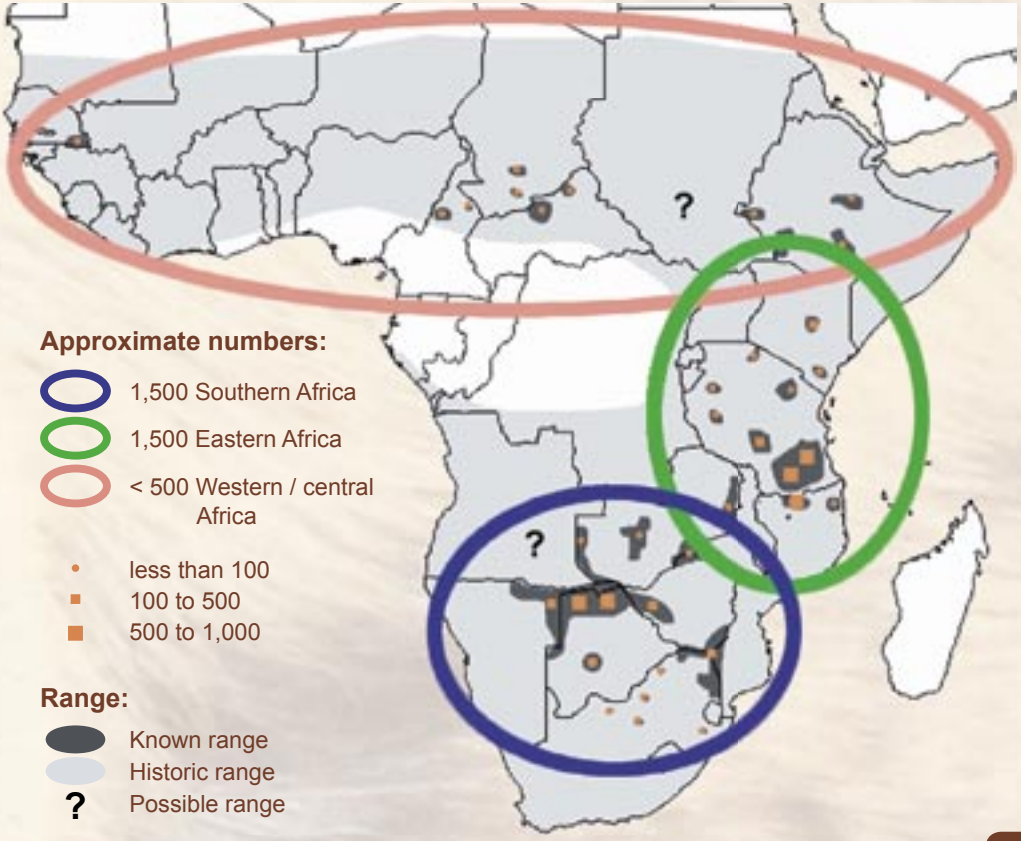
Longevity	Few individuals will live beyond 10 years. The oldest individual recorded was 11 years old. Most individuals live to 6-7 years in the wild
Gestation period	70 days
Seasonal breeding	Winter, in the Southern Hemisphere, but can be all year round
Age at first conception	Sexually mature by 18 months but reproduction is dominated by an older alpha female who is usually over 3 years old
Breeding lifetime	3-4 years if the female maintains alpha dominance
Fecundity	A litter typically consists of 8-12 pups. A female produces one litter per year
Age-specific mortality	1 in 3 pups die in their first year; adult mortality drops to 1 in 4 dogs per annum
Sex ratio (female:male)	In Namibia, 1:1.6
Density dependence	Unknown, since most populations are below carrying capacity

Under exceptional conditions, populations can increase quickly, recovering from localised extinction to medium densities in 5-7 years where habitat is not fragmented into isolated 'islands'.

Numbers and Distribution

Africa:

Estimates suggest that over 250,000 African Wild Dogs once inhabited the African continent and that their historical range included 39 sub-Saharan states. In the past century their numbers have declined to between 3,000 and 5,000 animals. Of these, 90% live in two distinct areas: southern Africa centered around northern-central Botswana, north-eastern Namibia and north-western Zimbabwe; and eastern Africa centered around northern Mozambique/southern-central Tanzania and central/ northern Kenya through to southern Ethiopia and southern Sudan. African Wild Dogs have been largely extirpated from central and western Africa but may still remain in limited numbers in north-eastern Africa. Currently only eight countries have connected populations exceeding 100 individuals, and only three countries - Botswana, Tanzania and Zimbabwe - support more than 500 individuals.



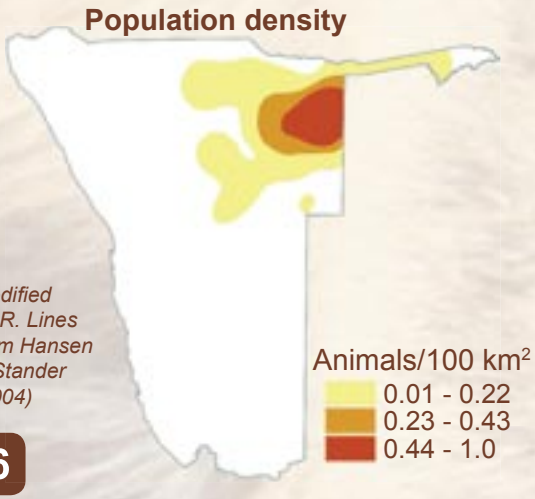
Modified by R. Lines from CSG, 2003

Country	Estimated population size and trend				Total
	In and around protected areas		Outside protected areas		
Angola	?	Unknown	?	Unknown	?
Botswana*	500	Stable	300	Unknown	800
Cameroon	50?	Declining?	0	-	50?
Central African Republic	150	Unknown	0	-	150?
Chad	70?	Unknown	0	-	70?
Ethiopia*	200?	Unknown	200?	Unknown	400?
Kenya	100	Stable	250	Increasing	350
Mozambique*	200	Unknown	Unknown	Unknown	200
Namibia*	100	Declining	150	Declining	250
Senegal	20?	Unknown	0	-	20?
Somalia	0	Unknown	20?	Unknown	20?
South Africa*	300	Stable	110	Increasing	410
Sudan	0	Unknown	50?	Unknown	50?
Tanzania*	1,300	Stable?	500	Stable?	1800
Zambia*	430	Unknown	-	-	430
Zimbabwe*	400	Declining	200	Declining	600
TOTAL	**3,820**		**1,580**		**5,400**

** Shaded area indicates connected populations of over 100 individuals.*
Modified by R. Lines from CSG (2004)

Namibia:

In Namibia, approximately 95% of African Wild Dogs live outside formally protected areas. They occur across a mosaic of rangelands under various forms of land ownership and land use including free-ranging wildlife areas and communal/freehold farmlands.



Modified by R. Lines from Hansen & Stander (2004)

Area	Last record
Orange River	1934
Keetmanshoop	1940s
Maltahöhe	1944
Karibib	1958
Windhoek	1959
Namib-Naukluft	1969-70
Kunene	1975
Etosha National Park/ North Central area*	Mid 1980s

** In the 1920s, the population in the greater Etosha area was estimated at 2,000 individuals*

Area	Status	Density: dogs per 100km²	Est. pop.	Trend	Likely threats
Khaudum National Park	Present	0.22 - 0.43	15	Decreasing?	Conflict and persecution adjacent to park boundaries
Tsumkwe	Present	0.43 - 1.0	75	Stable?	Conflict and persecution in bordering areas; road kills
Tsumeb	Vagrant	n/a	5	n/a	Conflict and persecution
Outjo	Vagrant	n/a	5	n/a	Conflict and persecution
Grootfontein	Uncommon	0.01 - 0.22	15	Unknown	Conflict and persecution; road kills
Otjiwarongo	Uncommon	0.01 - 0.22	5	Unknown	Conflict and persecution; road kills
Okakarara	Present	0.01 - 0.22	20	Decreasing?	Prey reduction; conflict and persecution; road kills
Gam / Eiseb	Present	0.01 - 0.22	25	Decreasing?	Prey reduction; conflict and persecution; road kills
Gobabis	Vagrant	n/a	5	n/a	Conflict and persecution; road kills
West Kavango	Uncommon	0.01 - 0.22	20	Unknown	Prey reduction; conflict and persecution; road kills
East Kavango	Present	0.22 - 0.43	25	Decreasing?	Prey reduction; conflict and persecution; road kills
Bwabwata National Park	Present	0.22 - 0.43	20	Unknown	Persecution; road kills
East Caprivi	Uncommon	0.01 - 0.22	15	Unknown	Prey reduction; conflict and persecution; road kills

Limiting Factors

Ecological factors:

Over 70% of Namibia regularly receives more than 200 mm rainfall and can be considered suitable habitat. African Wild Dogs can also flourish in more arid areas if suitable prey numbers are present, for example, where water is provided artificially or where ephemeral river systems support higher game numbers. Surface water is not a prerequisite as the species can be largely water independent, living for long periods off the high water content in the intestinal juices and blood of their prey.

Susceptibility to diseases such as rabies, canine parvovirus and distemper is not considered a greater conservation threat to the African Wild Dog than for any other large carnivore, but can be an important consideration in small isolated populations that require vaccinations prior to release. Competition for food with spotted hyaena and lion can limit the population density and distribution of the African Wild Dog, particularly in areas with lion densities > 1 per 10 km^2 and hyaena densities > 1 per 2 km^2 and in open habitats. However, there are no free-ranging areas in Namibia with densities as high as these.

Human factors:

The ecological factors which potentially affect African Wild Dog abundance and range are very much secondary to human-induced factors.

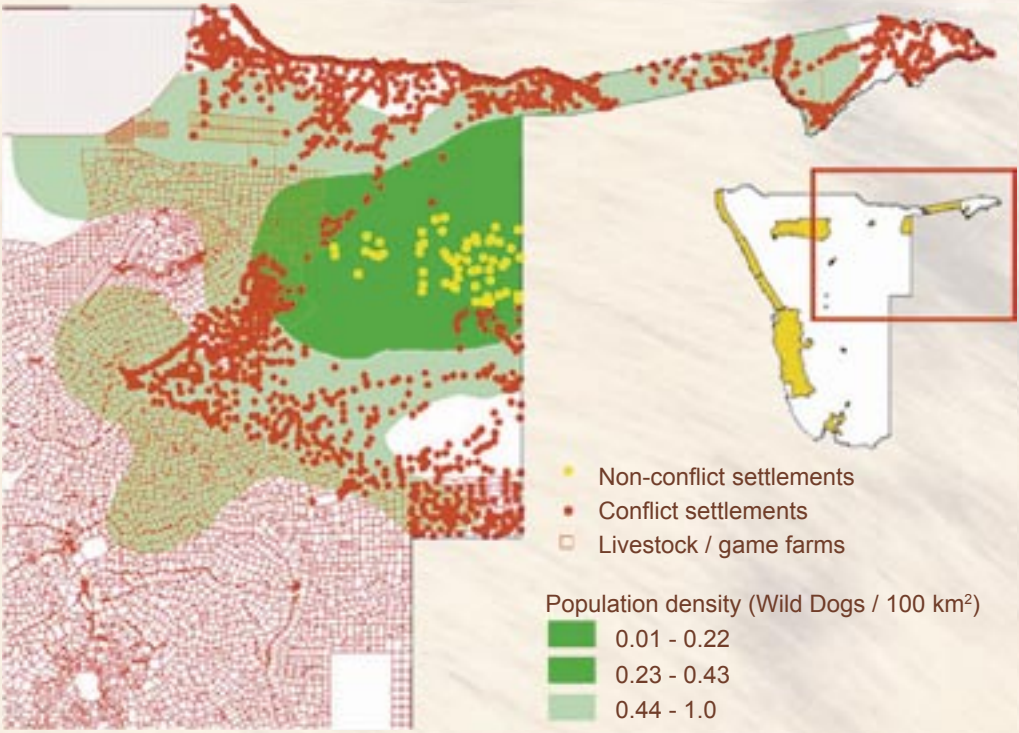
Human-induced persecution

Direct
shooting
poisoning
spearing
trapping
den burning

Indirect
road kills
prey reduction
domestic animal diseases

Human-induced persecution, both direct and indirect, and whether 'legally' conducted in defence of livestock or illegally as a consequence of prejudice and misunderstanding, kills in excess of 50 individuals in Namibia every year – perhaps 10% more than the reproductive rate. African Wild Dogs are particularly susceptible to disturbance and persecution during their breeding season and this is the time when they need most protection. A pack that is not allowed to recruit to their numbers through successful breeding has lower survival rates.

There is a direct negative correlation between farming settlements, conflict and African Wild Dog density and distribution in Namibia: more livestock farming results in more persecution and, consequently, lower African Wild Dog density.



Density (animals / 100 km²)	Area (km²)	No. of animals
Low (0.01 - 0.22)	117,300	12 - 26
Medium (0.23 - 0.43)	20,600	45 - 89
Highest (0.44 - 1.0)	24,000	103 - 144
TOTAL	**161,900**	**160 - 259**

In 2008 Namibia's Wild Dog population was estimated at between 160 and 259 animals with the population declining by 10% per annum.

A growing body of research indicates that persecuted packs are probably more likely to prey on livestock because their ability to successfully hunt wild prey has been reduced. If adults are killed and cannot teach their young the complex natural skills needed to hunt wild prey, the risk of livestock predation increases. Nonetheless it is still rare for African Wild Dogs to take more than 2-3% of livestock – well within tolerable levels. Crucially, where wild prey levels are maintained, even at modest levels of 2 kg/ha, and persecution is minimal, predation on livestock is almost zero, even under poor husbandry.

Significance

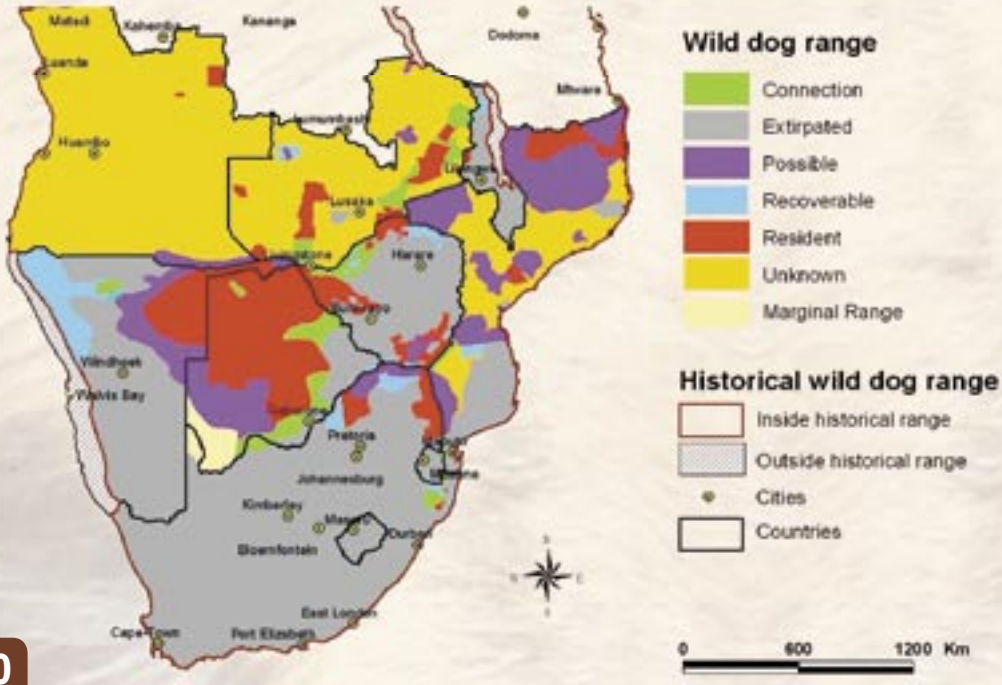
Conservation Significance

The African Wild Dog is classified as “Endangered”* in the IUCN Red Data Book. While once widespread through most of Africa, the species is now extinct from 24 of the 39 countries it was once present in. It is likely that numbers have declined by 98% from a historical estimate of at least 250,000 individuals. A similar story can be told in Namibia where conservative estimates suggest that Namibia’s population has declined from over 25,000 to the present level of 250 – representing a decline of 99%. Little commercial trade exists for African Wild Dogs and they are not CITES† listed. It is not trade in the species that threatens it with extinction.

In Namibia the African Wild Dog is classified as a Specially Protected Species, but this legislative protection has not prevented the species from becoming the most endangered large mammal in Namibia. Unsustainable persecution levels are widespread and common throughout the farmed areas. As a consequence of their immense home ranges combined with limited protected area coverage, all but a handful of packs in Namibia are subjected to human-induced persecution at some stage in their breeding cycle. Currently human persecution levels probably exceed

** Endangered = a species with a 20% chance of going extinct in 20 years*

† CITES = Convention on International Trade in Endangered Species of Wild Flora and Fauna



breeding recruitment, without taking into account natural mortalities. The rapid rate of land conversion from large wild areas to livestock farming, combined with the lack of protected area coverage and ineffective legal protection, further increase the likelihood that our population will be reduced to <1% of historical numbers within 5 years.

Immediate conservation intervention is needed to ensure the establishment of a viable population within the protected area network. Etosha National Park is the largest protected area in southern Africa within their former range to be considered recoverable range. As a first step, it would be appropriate to reintroduce the species to this park.

Economic Significance

Live trade in the species and the limited market for trophy hunting are economically insignificant, generating little direct revenue.

The economic significance of the species is strongly linked to Namibia's tourism sector. Namibia has an international reputation as a high-profile and maturing wildlife tourism destination and tourism currently generates approximately 14% of Namibia's Gross Domestic Product (contributing about N$ 6.6 billion in 2006). Repeated surveys indicate the high value that tourists put on sightings of this most charismatic species; for example, 75% of tourists surveyed in Kruger National Park in South Africa were willing to pay a supplement of between US$12 and US$59 for a sighting.

Small scale pilot studies in Nyae Nyae Conservancy, focusing on the incorporation of traditional San tracking skills into wildlife research and management, have shown that tourists are willing to pay in excess of US$100 per person/day to track African Wild Dogs and visit denning areas under close supervision of experienced personnel. Conservative estimates indicate revenue potential of US$80,000 per annum under the right management. Similar revenues could be expected from Khaudum National Park and Bwabwata National Park if joint ventures are established; the majority of the income would benefit the local communities through employment, training and other payments.

Reintroducing the species to Etosha National Park would generate high profile positive publicity and would, in addition, provide for the generation of significant income from specialised tours. Preliminary estimates suggest that an additional income in excess of US$100,000 per annum would be achievable. African Wild Dogs could thus directly contribute at least N$3 million annually to the Namibian economy - ten times the cost of their predation on livestock and valuable game.

The long term implications of specialised tours on African Wild Dogs and their conservation require ongoing research and adaptive management. Nonetheless, African Wild Dogs in Namibia represent an untapped resource requiring careful management.

Stakeholders

The primary stakeholders affected by the abundance or absence of African Wild Dogs in Namibia are landholders – the State through Parks, conservancies (on private and communal land) and other private and communal landowners.

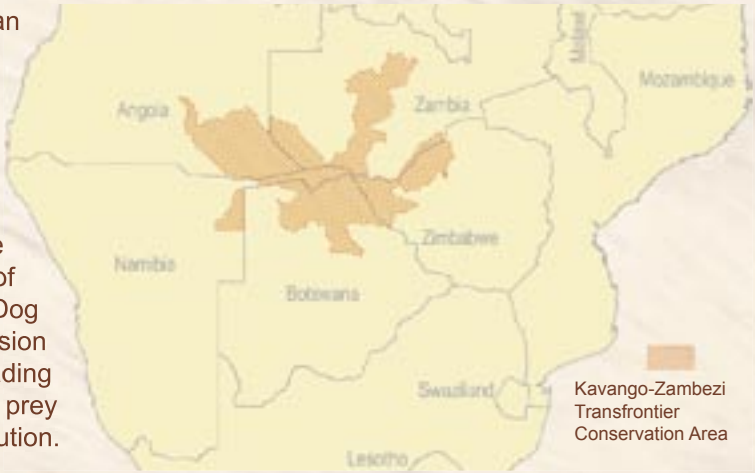
Secondary stakeholders are those who have investment in land and the wildlife industry, and who buy the products that primary stakeholder produce e.g. tour operators and tourists. Tertiary stakeholders include those with an interest in African Wild Dog conservation, including donors investing in community-based wildlife management and the international conservation community at large.

Early reintroductions to Etosha National Park were pioneering but largely unsuccessful for reasons we now understand following many successful reintroductions elsewhere. Fledgling interest in reintroductions to fenced private reserves is taking place in an *ad hoc* manner, which will do little towards a well managed recovery programme for this endangered species. A structured reintroduction to both Etosha and registered conservancies has the potential to broaden and increase benefits to primary stakeholders across much of the country where the economic benefits of sustainably managing land for wildlife are increasingly being realised.

Transboundary Co-operation

The development of the Kavango-Zambezi Transfrontier Conservation Area (KAZA) has the potential to promote and conserve a critically important population of African Wild Dogs, rivalling that of southern-central Tanzania. But this admirable long-term goal should not detract from immediate collaborative conservation initiatives between Namibia and the neighbouring range states – particularly Botswana, Zambia, Angola and Zimbabwe – where connectivity between sub-populations is essential. Strong linkages from north-eastern Namibia to the Okavango Delta, Ganzi District and through to the Central Kalahari Game Reserve will help maintain linkages through to south-eastern Botswana, south-western Zimbabwe and north-eastern South Africa and into Mozambique and East Africa. Linkages through Caprivi to south-eastern Angola, south-western Zambia and north-western Zimbabwe will have similar benefits in maintaining genetic fitness and population viability across borders.

Unplanned human settlement and the development of livestock farming in and around protected areas has serious negative implications on the population viability of the African Wild Dog through habitat conversion and fragmentation leading to a reduction of wild prey and increased persecution.



The Regionwide Conservation Planning workshop held in 2007 made significant progress in identifying key areas for research and management across international borders. The Regional Plan developed in 2008 advocates range states to develop and implement National Species Conservation Strategies based on Regional conservation imperatives. Progress is currently being made towards holding a Namibian workshop early in 2009, at which the strategic conservation interventions will be discussed and promoted.

Management

Goal

To increase the population of African Wild Dogs in Namibia to more than 1,000 individuals through active management of the existing free-ranging population, and the establishment of a second viable population under protected area coverage, combined with structured reintroductions to large freehold conservancies and other wildlife areas.

Namibia's population currently numbers around 250 individuals in less than 32 breeding packs. Analysis of density data over the past decade indicates an annual decline of around 10% a year under the current trend of livestock farm development in and adjacent to wildlife areas. Typically these developments lead to a reduction in wild prey and unsustainable levels of persecution as a consequence of historical prejudice and misunderstanding.

Additionally, a combination of immense home ranges and low population densities results in the protected area network sheltering perhaps 5% of the population from persecution. Consequently, about 95% of the population is periodically exposed to human-induced depredation, which results in reduced breeding success and declining population viability.

Ecological Objectives

Given the semi-arid nature of Namibia, where prey numbers are limited by rainfall, African Wild Dog densities are unlikely to exceed 2.0 individuals/100 km^2 even under the most favourable circumstances where suitable prey densities approach 5 kg/ha - such as the more productive habitats in Etosha National Park.

Based on these broad estimates the goal of reaching a population of over 1,000 individuals, in 125 packs averaging 8 adults and yearlings, will require the density of African Wild Dogs in suitable habitats to be increased as shown on the following page. A reintroduction to Etosha and assisted recolonisation to the north-west should be viewed as a 10 year programme of research and management until a viable population, capable of withstanding a degree of conflict and persecution, exists.

Density levels required to increase the population of African Wild Dogs in Namibia to 1,000 individuals:

Free-ranging population				
Area	Suitable habitat (km^2)	Average density (per 100 km^2)	Packs†	Population
Tsumkwe District	20,000	1.0	25	200
Khaudum National Park	3,900	1.5	7	59
East Kavango*	8,500	0.5	5	43
West Kavango*	5,500	0.25	2	14
Bwabwata National Park	5,800	1.5	11	88
East Caprivi*	3,500	1.0	4	35
Etosha National Park‡	17,000	2.0	43	340
Kunene*#	45,000	0.25	14	113
Gam / Eiseb Districts*	14,500	0.25	5	36
Okakarara District*	7,500	0.25	3	19
Waterberg Plateau	4,500	0.5	3	23
Commercial farmlands	55,500	0.1	7	56
Sub-total	**191,200**	**-**	**129**	**1,026**

Captive population				
Commercial Conservancies	8,750	0.5	6	44
Private Game Reserves	6,500	1.0	8	65
Sub-total	**15,250**	**-**	**14**	**109**

Total				
Namibia	**206,450**	**-**	**143**	**1,135**

** Wildlife-based land areas away from livestock farming communities; † Approximated for mean home ranges scaled from 4,000 to 750 km^2 based on prey-depleted (<1 kg/ha) habitats; ‡ Excluding pan, considered to be connecting habitat; # Above 200 mm rainfall isocline - assisted recolonisation from Etosha National Park.*

This would represent a 28% increase in the species' current range and would bring the population size up from around 1% to around 5% of historical levels. Most importantly, it would secure the long-term survival of the African Wild Dog in Namibia.

VISION

To ensure, in the long-term, a viable, free-ranging and secure population of African Wild Dogs in Namibia, as a component of wildlife based land use through sustainable management practices, for the benefit of all Namibians.

Key Management Interventions

A population increase of this level could be achieved within a decade through proactive conservation interventions requiring strong state support from the Ministry of Environment and Tourism together with private sector and NGO stakeholders. Environmental education, training in conflict mitigation and post release monitoring are essential.

Key management interventions:

- Reintroduce African Wild Dogs to Etosha National Park and assist recolonisation to wildlife areas in Kunene Region;
- Limit human-induced persecution in current free-ranging population through environmental education, community outreach and law enforcement;
- Reduce road kills in wildlife areas through traffic calming measures;
- Maintain and improve prey densities in and around wildlife areas;
- Train local farming communities in the benefits of integrated livestock and predator management.

This booklet is an addition to a series of booklets which provides an overview of 5 groups of species:

Southern Savanna Buffalo *Syncerus caffer caffer*

Savanna Elephant *Loxodonta africana africana*

Hippopotamus *Hippopotamus amphibius*

Roan Antelope *Hippotragus equinus*
Sable Antelope *Hippotragus niger niger*
Tsessebe *Damaliscus lunatus lunatus*

Southern Reedbuck *Redunca arundinum arundinum*
Common Waterbuck *Kobus ellipsiprymnus ellipsiprymnus*
Red Lechwe *Kobus leche leche*
Puku *Kobus vardoni*

The Namibian Wild Dog Project

The Namibian Wild Dog Project was conceived by Namibia Nature Foundation (NNF) in 2002 in response to a growth in local community complaints about African Wild Dogs following the progressive registration of Communal Conservancies in the Eastern Communal Lands.

The Wild Dog Project's aim is to combine ecological, social and economic approaches to conservation, increasing the understanding of interactions between African Wild Dogs and humans, and finding ways of mitigating conflict and persecution. The project promotes stakeholder involvement in active management based on rigorous scientific enquiry, while engaging in environmental education and tourism development as a means of realising economic value.

The Wild Dog Project is a long term interdisciplinary study and conservation initiative under the management of Robin Lines and NNF.

The Namibian Wild Dog Project, PO Box 245, Windhoek, Namibia
wilddog@mweb.com.na; www.nnf.org.na/wilddogproject.htm

Wild Dog project

Photos: front cover, p1, p2, p12 all, p14 left, p16 R. Lines; p3 C. and T. Stuart; p7 all, p11, p14 middle K. Landen; p8 S. Selbert; p14 right M. Chase.

African Wild Dog Project
of the
Namibia Nature Foundation

www.nnf.org.na

February 2009

Booklet designed by Alice Jarvis