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Attempts to reintroduce African wild dogs *Lycaon pictus* into Etosha National Park, Namibia

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Three attempts were made to reintroduce African wild dogs *Lycaon pictus* into Etosha National Park, Namibia. These attempts failed because the packs were released under sub-optimal circumstances in areas with low prey densities, the dogs were inexperienced hunters as pups were reared in captivity, and the dogs were vulnerable to predation by lions. Four wild dogs died from rabies. Prey killed by wild dogs included springbok *Antidorcas marsupialis*, Burchell's zebra *Equus burchelli* and springhare *Pedetes capensis*.

Keywords: African wild dog, rabies, reintroduction

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There has been a sharp decline in wild dogs *Lycaon pictus* throughout their historic range in Africa (Fanshawe, Frame & Ginsberg 1991). An increased human density, resulting in habitat fragmentation and conflict (Childes 1988), vulnerability to disease (Schaller 1972; Dobson & Hudson 1986;Van Heerden 1979, 1980; Ginsberg & Macdonald 1990), high pup mortality (Smithers 1983), predation (Estes & Goddard 1967), large home ranges and prey decline (Reich 1981) have all played a role in their decline.

African wild dogs historically occurred throughout Namibia, except in the extreme south (Shortridge 1934). Presently, few wild dogs occur permanently in national parks or conservation areas in Namibia, contrary to elsewhere in southern Africa (Childes 1988), but do still occur in the east and north-east of the country (Hines 1990). In areas occupied by hunter gatherers, such as Bushmanland, wild dogs are largely tolerated as they pose little threat to the local people, whereas in commercial farming areas, they are regarded as vermin and killed at every opportunity.

In 1962 alone, 81 wild dogs were destroyed on the southern boundary of the Etosha National Park (Dept. Report N 45/2/1), after conflict with domestic livestock. The last resident pack of wild dogs in Etosha N.P. consisted of 16 individuals that occurred around Homob on the southern edge of the Pan until 1970. Small groups of dogs are sporadically recorded in the Park, entering the Park from the north or north-east. None of these groups, however, become resident. In western Etosha, six observations of wild dog packs numbering between three and 15 individuals, were made in 1978, while the last wild dog was recorded in that area in 1983. In the north-eastern end of the Park, 13 wild dogs were recorded in 1986.

The Etosha National Park (ENP) meets most of the basic requirements for a successful wild dog reintroduction programme as outlined by Holloway & Jungius (1973). The size of the ENP (22 270 km^2), its suitable habitat, and prey abundance should theoretically be able to sustain the species.

In view of the uncertain future of African wild dogs in Namibia, and in order to maintain the species diversity in the ENP, three attempts were made to reintroduce wild dogs into the ENP. The first attempt was made in 1978 when six dogs were released on the southern edge of the Pan. These dogs were raised from pups and released at an age of one year. They all died within four months after release, mainly owing to starvation or predation by lions (Dept. Report).

A second attempt was made in 1989. The pack consisted of five adult dogs, offspring of Namibian dogs, but bred in captivity at De Wildt Cheetah Breeding Station, South Africa. These dogs all died of unknown causes within three months after release at Okawao, in western ENP.

A successful reintroduction of wild dogs into the Hluhluwe Game Reserve in South Africa (Rowe-Rowe 1992), encouraged the Etosha staff to attempt a third reintroduction of wild dogs into the ENP. The results of this attempt could be valuable in future attempts to introduce this vulnerable species into the wild. A pack of thirteen captive bred dogs was acquired from a private game dealer in January 1990. All the dogs were of the southern African genotype as they were offspring of dogs captured in Namibia. The group consisted of five males (three adult) and eight females (three adult) and their ages ranged from 1–4 years. While in captivity, the dogs were vaccinated against rabies annually, and against canine distemper at twelve weeks old (W. Delfs pers. comm.).

An adult male and female dog escaped while being transported to ENP. The female was shot a week later on a farm. The male formed a pack with two domestic dogs and hunted as a pack until it was trapped in the Von Bach Nature Reserve (350 km south of ENP) three weeks after its escape.

In ENP, the pack was held in a 2-ha enclosure adjacent to Grootvlakte where they were to be released. Care was taken to limit human presence at the holding facility to the minimum. An adult male and female were immobilized using 2,2 mg/kg Zoletil (Virbac, France), and radio-collared. The dogs were fed once daily and their diet consisted of springbok carcases or live springbok which were released into the pen. Each dog received an average of 2,5–4 kg meat per day. While the dogs initially attempted to hunt the live springbok provided to them in the enclosure, they soon realized that one individual could chase the prey into the fence where it either broke its neck, or was easy to kill.

When the escaped adult male was reintroduced to the pack in captivity, it was immediately attacked by the pack, the pups initiating the aggression. The male was moved to a pen within the holding facility, but it escaped and was immediately killed by pack members with bites on the spine and neck.

In order to provide abundant prey to the inexperienced dogs, and limit the period spent in a small enclosure, we released the pack on Grootvlakte in early March 1990. Plains ungulates such as springbok, Burchell's zebra, and wildebeest give birth and graze on the short grass plains during the rainy season (December–April).

In 1990, an average rainfall year, there was only a partial, late migration of plains ungulates to Grootvlakte. When they arrived on the plains, they had already given birth weeks before and few neonates were present when the wild dogs were released.

During the first month the pack was monitored continuously for food intake, activity, interaction with other preda-

tors, and movement. In the event of the dogs not feeding for 2–3 days, a springbok carcass was provided. The following is a chronology of events.

Week 1

The pack's first encounter with prey was with an adult wildebeest *Connochaetes taurinus* that stood its ground and chased the dogs off. Apart from showing curiosity, the dogs did not seem to regard the wildebeest as prey. On their first encounter with a springbok *Antidorcas marsupialis* herd, the dogs started a hunt from 500 m away. The hunt was uncoordinated and every dog hunted its own prey. The dogs pursued the prey for about 400 m, after which they lost interest. During the first week the dogs showed no signs of a coordinated hunting technique, as was described by Estes & Goddard (1967). The dogs hunted unsuccessfully from 17h00 until 02h00 the following morning, and again in the mornings from an hour before dawn (06h00) until 09h30. After a week, springbok became very alert and performed the stotting display described by Estes & Goddard (1967) when the dogs appeared on the plains. Flight distances of springbok increased from < 100 m to > 250 m in less than two weeks. The pack ignored carcases of prey species that had died of anthrax, and food had to be provided every second day.

Weeks 2–4

During the third week after release, when most springbok had left the plains, the dogs switched their attention to Burchell's zebra. Initially they hunted bachelor herds, but were driven off. Similar observations were made by Malcolm & Van Lawick (1975) in the Serengeti. When the dogs switched to zebra family groups, they showed the first signs of a hunting strategy. While one or two dogs kept the stallion occupied, the rest of the pack pursued the herd and tried to separate a foal from it. At the end of the forth week, the pack encountered a day-old zebra carcass and fed from it for two days. The carcass tested positive for anthrax, but the dogs did not become infected. They located a wildebeest carcass with an adult male lion feeding on it, and in an attempt to displace the lion, one dog was killed.

Weeks 5–8

Five weeks after release, the pack made their first kill, a zebra foal less than one week old. During the following three weeks they killed three more foals, all younger than one month old.

A male wild dog sustained injuries, presumably during a hunt, or from a large predator. The dog was removed from the pack, treated and reintroduced to the pack three weeks later. It was accepted immediately with no signs of aggression from the pack.

At this stage the pack was active only in the late afternoons and early mornings before dawn, until 09h00.

Weeks 9–16

When the last zebras moved from Grootvlakte, the pack was moved 30 km east to an area (Okondeka) with higher prey density. This was done by dragging a carcass behind a vehicle, with the dogs following. On arrival at Okondeka, the resident lion pride immediately attacked the dogs, killing one. Three days after this incident, the wild dogs were located back on Grootvlakte and had to be moved to the Okaukuejo plains. During the following weeks, two more dogs were killed by lions and one dog went missing and was never accounted for.

As the dogs lost condition and became lethargic, they were taught to hunt springhare *Pedetes capensis*. This was done by blinding springhares using a spotlight. The six dogs killed as many as 19 springhares in one night before losing interest.

At the end of the sixteenth week, the pack made their first recorded springbok kill, an adult male. The dogs became more skilled at cutting corners, and successfully ran prey down over distances of up to 3 km.

Weeks 17–22

During this period the dogs were not monitored regularly, but their movements were recorded through tourist observations. Younger dogs of both sexes initiated hunts and killed springbok. However, when the two radio-collared dogs were also killed by lions, the remaining four dogs ceased to hunt and started scavenging around the tourist camp. The dogs lost condition and enlarged their range, making them increasingly difficult to locate.

After tourists observed the remaining dogs killing and feeding on a black-backed jackal *Canis mesomelas*, the dogs were captured and moved to a holding facility. They all died within two weeks after showing purulent oculo-nasal discharges and dehydration. Although canine distemper was suspected, tests confirmed that all had died from rabies.

Interaction with other predators

The pack encountered cheetahs on a kill once and was unable to displace them as was reported by Malcolm & Marten (1982). The adult female cheetah and three cubs were feeding on a springbok carcass and, although the seven dogs had not fed for two days, they did not displace the cheetahs, but scavenged on the remains after the cheetahs abandoned the carcass.

On two occasions the wild dogs displaced single spotted hyaenas from their kill. Single hyaenas could not appropriate kills from the wild dogs (n = 4). Similar observations were reported by Pienaar (1969) for the Kruger National Park, and Fuller & Kat (1990) for East Africa.

Lions did not tolerate the pack in their home range and six dogs were killed by lions. Lions did not feed on the wild dog carcases. The lions stalked the dogs whenever they came within sight and the dogs never showed any signs of aggression towards lions, as was reported by Pienaar (1969) from the Kruger National Park. Black-backed jackals were tolerated around kills and seldom chased. Wild dog encounters with domestic dogs, and the absence of interspecific aggression have been recorded before (Butynski 1974). The close association of the two species for the acquisition of food, however, has not been recorded before.

Intraspecific behaviour

On two occasions male dogs were reintroduced to the pack after an absence of about three weeks. The dog which associated with the domestic dogs was immediately killed by the pack, while the injured dog was accepted back into the pack.

This led us to believe that olfaction could possibly play a bigger role in the identification of pack members than is believed.

Contrary to reports by Estes & Goddard (1967), the pack never fed injured members. Injured dogs either had to keep up with the pack, or were abandoned.

The wild dog reintroduction programme revealed problems similar to those in most other carnivore reintroduction programmes (Yalden 1993; Wemmer & Sunquist 1988). Unlike with ungulates, few reintroductions of captive-bred large carnivores succeed (Henshaw, Lockwood, Shidler & Stephenson 1979; Mills 1991). Captive bred wild dogs are at a disadvantage when compared with 'wild' wild dogs, as they lack hunting skills and the awareness of other competing large carnivores such as lion, hyaena and leopard.

The timing of the reintroduction was not optimal to ensure the development of hunting skills of the pack. As a result of below average rainfall, the annual migration was two months late, which resulted in low prey densities and few neonates in the area where the dogs were released. The dogs failed to follow the prey from the summer grazing short grass plains to the eastern parts of the Park and rather relied on human intervention for the provision of food.

As the last four wild dogs died from rabies within two weeks after feeding on a black-backed jackal, we suspect that the jackal was the vector: there is a high incidence of rabies in black-backed jackal in the ENP (Berry 1993). This strongly indicates that the effectiveness of rabies vaccines in free-ranging wild dogs should be investigated.

Although a more viable pack was reintroduced into ENP on our third attempt, it failed for various reasons. If the reversal of the factors causal to the extinction of carnivores in an area is a prerequisite for their successful reintroduction, as suggested by Yalden (1993), lions and wild dogs could possibly not coexist in the present ENP system. Artificial water points possibly resulted in higher lion densities (Stander 1991) when compared with conditions in the past, when wild dogs commonly occurred in and around the ENP. The existing commercial farming practices on the ENP southern boundary, and increasing human densities on the northern boundary, could potentially cause more wild dog-livestock conflicts in the future than in the past, to the detriment of survival of wild dogs in ENP.

If another attempt should be made in the future to reintroduce wild dogs into ENP, wild animals should be used. Although such animals would tend to return to their former range, they would possess the basic hunting skills and would not be habituated to humans. Their knowledge of competing large carnivores would also increase their chances of survival.

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