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Field Report

Distribution and conservation of African wild dogs in Cameroon

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Abstract

The African wild dog (*Lycaon pictus*) has declined dramatically during the last century and has experienced a significant reduction in its range throughout sub-Saharan Africa. Very little is known about wild dogs in Central Africa, especially the population in northern Cameroon. Human and ecological factors limiting wild dogs in and around Faro National Park were investigated in 2000/2001. Wild dogs are distributed throughout the protected areas in northern Cameroon but at very low densities. They are mainly concentrated in the north of Faro National Park and the southeast of Benoue National Park. Their numbers seem to have been drastically reduced from several hundreds to around 50, and pack size also seems to have declined immensely in the last decades. Fieldwork, interviews and literature reviews show that habitat loss, loss of prey and direct persecution by Fulani herdsman have been the major causes for the decline of wild dogs in northern Cameroon, and these threats still exist today. Other factors known to negatively impact wild dog populations such as snaring, road kills, diseases, and competition

with other large carnivores are also present in northern Cameroon. The highest priority for wild dog conservation in northern Cameroon is to maintain contiguity of wildlife areas and to limit direct persecution. The establishment of a wild dog conservation project is highly recommended in order to reduce human induced mortality, to increase knowledge of wild dogs' behavioural ecology, to involve local people and to promote wildlife conservation.

Introduction

Little is known about the remnants of the Endangered African wild dog in Central Africa. The information on the wild dog population in northern Cameroon comes from a few quantitative surveys (Woodroffe and Ginsberg 1999), although the population in Cameroon is a priority for African wild dog conservation (Woodroffe et al. 1997). This paper aims to summarise past and present information on the distribution and status of wild dogs in northern Cameroon. Causes and consequences of wild dog decline are identified, and priorities for wild dog conservation in northern

Cameroon are proposed. The information is compared with results from an interview study, which was carried out in 28 villages in the periphery of the national parks and hunting zones of the North Province in 1999 (Bene Bene et al. 1999). Management strategies relating to wild dog conservation are discussed.

Methods

Faro National Park, FNP (3,300km²) is one of three national parks (also Benoue National Park, BNP (1,800km²) and Bouba Ndjida Na-

tional Park, BNNP (2,200km²) in northern Cameroon. The protected areas in the GEF savanna ecosystem component (30,692km²) south of the provincial capital also include 26 hunting zones, one research zone of the Garoua Wildlife School (Z19), and a game farming zone (Z8b) (Figure 1). The main vegetation type is Sudanian woodland savannah, dominated by a dry season from November until April. The rainy season from May until October brings 1,200-1,400mm rainfall.

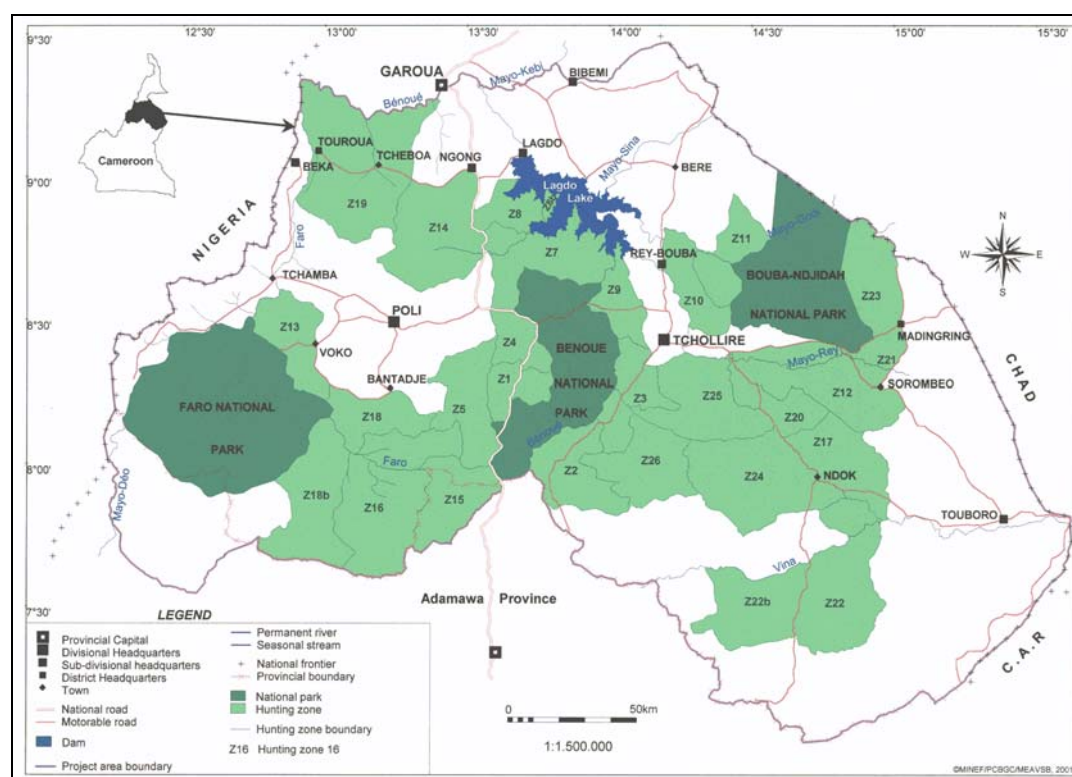


Figure 1. Protected areas in northern Cameroon

After all available literature on prior research in wild dogs in northern Cameroon was studied, the author visited the Doudja-Region in the south-east of BNP and the north of FNP for some days in December. Fieldwork was conducted in FNP, because the area seemed to harbour the highest number of remaining wild dogs in northern Cameroon in 1999 (Bene Bene et al. 1999).

The field survey was conducted in the northern

part of FNP, adjoining hunting zones (Z13 and Z18) and a community-hunting zone between the villages Voko and Bantadje (ZVB). The field team generally consisted of three trackers, the author and occasionally a game guard. An area of over 900km² was covered on foot (more than 2,000km of random walks) on 88 days (between 6h30 and 17h30) between January and June 2001. FNP was surveyed on 61 days from January-May (49 days between Mayo Nial and Mayo Fel, 12 days between Mayo Nial and

Mayo Life), ZVB and Z18 (eight days/end of April-beginning May), and Z13 (19 days/June). During these walks all wild dog and other large carnivore observations and indirect signs, such as spoor, dens and faeces were recorded by taking a GPS position. Indirect signs were positively identified and aged with the help of trackers and field guides (Breuer 2001). Additionally, only signs more than ten kilometres away from villages were attributed to wild dogs because of the presence of domestic dogs (*Canis familiaris*). Interviews were conducted around FNP with villagers, game guards and the conservator of FNP using pre-formulated questionnaires (Breuer 2001). Additionally, simple discussions, especially in the local market, gave an insight into peoples' attitudes towards wild dogs. All reported sightings during 2000/2001 (provided by villagers, trackers, poachers, game guards, researchers and conservators of national parks) of wild dogs in northern Cameroon were noted, although no intensive interviews were conducted outside FNP.

Results

Present distribution of wild dogs in northern Cameroon

Figure 2 shows the locations where observations of wild dogs were reported in 2000/2001 in the Faro region. Only indirect signs of wild dogs were made during fieldwork. In total, 32 cases of spoor were recorded, of which the majority of observations (81%) were from Z13. Only a few cases of spoor were recorded in FNP and in ZVB. Faeces were found eight times. Four former dens were localized with the help of trackers. One of the two dens in FNP was found on an inselberg in the eastern tip of FNP and was used by spotted hyenas (*Crocuta crocuta*) and lions (*Panthera leo*). Lion faeces and spoor were found near the second denning area. The two other dens were found in the ZCB. Fulani herdsman burned one of them in 2000.

Lions and spotted hyenas are present throughout the study area. Lions are mainly concentrated along watercourses and riparian vegetation.

Table 1 summarises the reported observations of wild dogs in northern Cameroon. Data pro-

vided only a small amount of information on age and sex structure of the packs. Sometimes, information was given only on a sighting without numbers of wild dogs seen, and without the date. Observed pack size varied from one to 15 wild dogs. Average pack size was 6.6 ± 0.9 (including only observations reporting a quantitative pack size). Some observations might be of the same pack, especially in the northern part of FNP. If the reported sightings of 15, eight and 12 wild dogs were of only three different packs, then average pack size is reduced to 4.7 ± 0.8 . Calculated mean pack size from the interview study of Bene Bene et al. (1999) is 10 ± 2.2 . The highest densities of wild dog in northern Cameroon are found in the north of FNP and its adjoining hunting zones as well as Z2, Z25 and Z26 south-east of BNP and in the south of BNNP. All reported sightings of packs larger than 12 wild dogs were reported in and around FNP only, and might represent one single pack which ranges in Z13 (see below). Direct observations of wild dogs by trackers of the professional hunter in Z13 were not uncommon, and it seems that wild dogs frequently range in this area. There was no wild dog observation in Z18bis in the season 2000/2001. The hunting guide in Z18 did not provide any information on wild dogs, and he was not co-operative. Wild dogs seem to be rare in the east of FNP and the adjoining hunting zones. Except for one sighting of seven wild dogs, all reported sightings were for solitary animals or packs not larger than three wild dogs. This is in strong contradiction to their former abundance in this area. The reason for this decline is unknown, but might be attributed to direct persecution and a rabies outbreak in the villages between Voko and Mayo Djarindi (Kuwong, pers. comm.). There were only a few reported sightings of wild dogs in the northern part of FNP. Game guards rarely make patrols, and other people do not provide information on wild dogs because this might indicate that they have been inside the park illegally. From the observations reported from the north-western part of the area it is clear that wild dogs frequently range outside protected areas. They were additionally seen in 2000 in and around the villages west of FNP. Pups are born at the end of the rainy season and the beginning of the dry season around October. One pack, which ranges in the northern part of FNP and Z13, successfully raised five pups in the breeding season of 2000/2001. A breeding pack was also reported south-east of BNP in

December. Sightings in other areas than FNP are rare and packs seem to be very small. During the 2000/2001 season, no wild dogs were seen in Z9, although more than ten wild dogs

were reported during a previous survey (Bene Bene et al. 1999) (Figure 3).

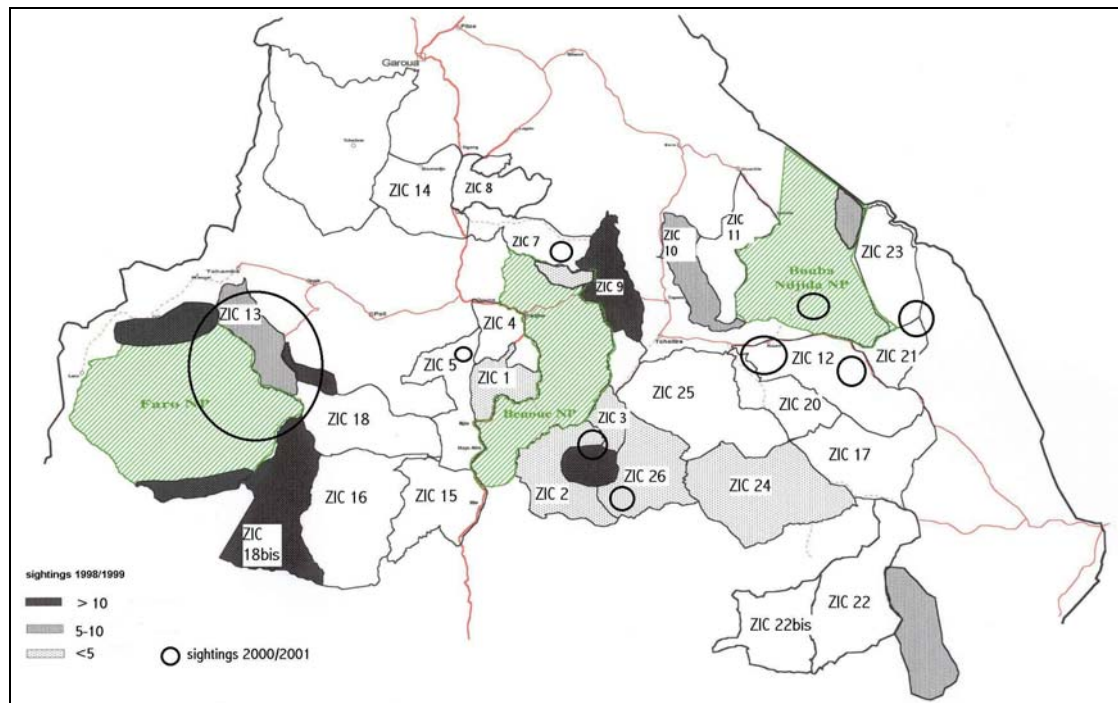


Figure 2. Reported sightings of wild dogs in northern Cameroon 1998/1999 and 2000/2001 (modified from Bene Bene et al. 1999)

Wild dogs were located south of BNNP during 2001, which may indicate that the population is contiguous with BNP, although no wild dog sign was found during a field survey from April-September 2001 (Kock, pers. comm.). No wild dogs were seen in BNNP during a large mammal count during January/February 2001 (Gomsé, pers. comm.). Observations in BNP are also very rare. No information from the south and west of FNP was available.

Distribution and status of wild dogs in northern Cameroon

No attempt was made to estimate wild dog numbers in the Faro region based on spoor pattern. Spoor is not seen on the hard soil. Antelopes and wind blur spoor in the sand of seasonal rivers. Spoor is only clearly seen in the mud near water points over a longer period. Spoor is highly visible during rainy season, but

is effaced by new rain.

It is clear that wild dogs are distributed over the whole protected areas net in northern Cameroon but at a very low density. Wild dogs have declined dramatically in BNNP since the 1970s. Bosch (1976) estimated the wild dog population in BNNP alone to around 40-80 animals in the 1970s. No population estimate of wild dogs in earlier years from other regions is available. Table 2 summarises population estimations by Bene Bene et al. (1999) and this survey. The estimation of the population by the interview study of Bene Bene et al. (1999) appropriately describes the mosaic-like distribution of the packs. They estimated that there are around 50 wild dogs remaining in northern Cameroon (population estimation for 1998: 49; 1999: 61) (Bene Bene et al. (1999)) (Table 2).

Table 1. Reported wild dog observations in northern Cameroon 2000/2001

Date	Protected area	Location	Number	Adults	Male	Fem	Juv
September 2000	Bouba Ndjida NP	Mayo Demsa	4	?	?	?	?
March 2001	South of Bouba Ndjida NP	15 km from village Tam	6	?	?	?	?
December 2000	Faro NP (east)	15 km southeast of Camp Hippopotame	7	?	?	?	?
Mid April 2001	Faro NP (east)	Eastern tip	2	?	?	?	?
Begin 2000	Faro NP (north)		12	?	?	?	?
10 November 2000	Faro NP (north)	Mayo Isselou near Tongo	8	6	3	3	2
20 November 2000	Faro NP (north)	near Mali	12	9	5	4	3
November 2000	Faro NP (north)	Mayo Nial	2	?	?	?	?
November 2000	Faro NP (north)	Confluence of Mayo Kokalti	14-15	?	?	?	?
February 2001	Faro NP (north)	Faro NP (Tapare)	2	2	?	?	?
March 2001	Faro NP (north)	near Mayo Fel	many	?	?	?	?
Mid March 2001	Faro NP (north)	Mayo Faro, near Mayo Fel	6	6	?	?	?
16 April 2001	ZCB Voko-Bantadje	Mayo Boukar between Djonge and Bantadje	2	?	?	?	?
January 2001	ZCB Voko-Bantadje	Bantadje	1	1	?	?	?
November 2000	ZIC 2		?	?	?	?	?
2000/2001	ZIC 5		?	?	?	?	?
February 2001	ZIC 7		4	?	?	?	?
?	ZIC 12		6	?	?	?	?
March 2000	ZIC 12		8	?	?	?	?
20 May 2001	ZIC 13	near Dundai	14-15	?	?	?	?
25 May 2001	ZIC 13		15	10	?	?	5
April 2000	ZIC 13		1	?	?	?	?
Begin March 2001	ZIC 13	8 km north-east of Dschalingo	many	?	?	?	?
End March 2001	ZIC 13	near Mayo Djarindi	3	3	?	?	?
January 2001	ZIC 13		6	6	?	?	?
March 2001	ZIC 13	5 km from Mayo Faro	1	?	?	?	?
March 2001	ZIC 13		8	8	?	?	?
March 2001	ZIC 13	Mayo Konoue	4	?	?	?	?
May 2001	ZIC 13		8	8	?	?	?
Mid April 2001	ZIC 13	near Campement des Hippopotame	6	?	?	?	?
November 2000	ZIC 13		14-15	10	?	?	4
November 2000	ZIC 13	near Dundai	14-15	?	?	?	?
10 June 2001	ZIC 18	Mayo Djarindi near Taroua	1	1	1	?	?
?	ZIC 23/21	Mayo-Djame	4	?	?	?	?
4 June 2000	ZIC 26	Hosere Mbansi	6	?	?	?	?

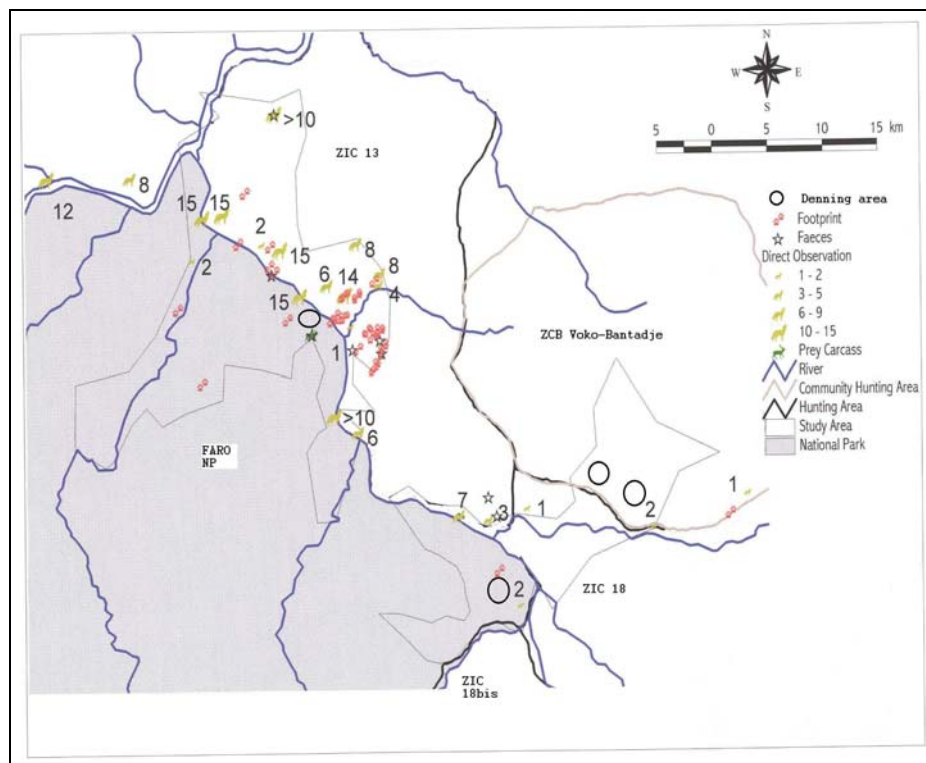


Figure 3. Wild dog signs and location of direct sightings (with number of wild dogs seen) in and around Faro NP 2000/2001

Table 2. Estimated number of remaining wild dogs in northern Cameroon (Source: Bene Bene et al. 1999, Breuer 2002)

Year	Number of observed Wild Dogs			Population Size
	Faro NP & Surroundings	Benoue NP & Surroundings	Bouba Ndjida NP & Surroundings	
1998	20	15	14	49
1999	35	23	3	61
2000/01	20-30	10-20	5-15	35-65

This gives a density of 0.0016-0.002 wild dogs/km² for northern Cameroon. The information on reported sightings in 2000/2001 is not very detailed. It is very difficult to give an accurate population estimation of wild dogs in northern Cameroon based on sightings in 2000/2001, so that Figure 3 shows locations of sightings only. If two packs are occurring in the northern part of FNP and adjoining hunting zones, there might be around 25 wild dogs

(15 + eight + solitary ranging individuals) in this area. But it is not clear if two packs range in the Faro area, because pack members can form sub-units or can separate for some days and rejoin later (Sillero-Zubiri, pers. comm.). One breeding pack of four to six wild dogs exists in the south-east of BNP and observations of a pack of four wild dogs north of BNP have been made. There is at least one pack of four to six wild dogs ranging in the south of

BNNP (Figure 3). A pack of four wild dogs was seen in the north of BNP in Z4. Wild dog numbers between FNP and BNP are unknown. In total there are at least 25 wild dogs occurring in the areas where information was available, but possibly 41 (Table 2), giving a very low density of 0.0008-0.0013 wild dogs/km². Wild dogs seem to be extinct around Ngaoundere, north of the Lagdo Sea and north of Poli in Z14 and Z19. Wild dogs were reported to exist south of FNP in the mountain forests of Tchabal Mbabo, 100km south of FNP (GEF 2001, Anon., pers. comm.). Wild dogs are still present in Gashaka Gumti NP, Nigeria, 200km south-west of FNP (Baggett 1998). They are frequently seen in the Mbere Valley in the extreme south-east of the North Province south of Touboro (Chad Export Project 1999). Wild dogs might have never occurred in the Waza-Logone floodplain in the extreme north (Woodroffe et al. 1997).

Factors limiting wild dogs in northern Cameroon

MINEF (Ministry of Environment and Forestry) upgraded the legal protection of wild dogs in 1998 from partial protection to a total ban on hunting. Fieldwork, interview results and literature reviews showed that wild dogs are exposed to the same threats as have been reported in other populations in Africa (Woodroffe et al. 1997). Bene Bene et al. (1999) report that wild dogs were systematically eradicated by Fulani herdsmen around the villages near Ngaoundere and are now extinct in these areas. Villagers told that the Fulani regularly killed wild dogs around their dens near the village Mbe between FNP and BNP (Bene Bene et al. 1999). It was reported that they have killed juveniles in the ZCB Voko-Bantadje east of Faro (Kuwong 2000). Fulani herdsmen are present throughout northern Cameroon and regularly use protected areas as grazing pastures for their cattle (MINEF 2000, Breuer and Mühlenberg in prep. a)

Wild dogs have been a trophy species before their revalorisation to category A in 1999. Killing of wild dogs might still be carried out in some hunting zones (Bene Bene et al. 1999; Owada 2000) but there is no evidence for this (Breuer 2002). A hunting guide shot one pregnant wild dog in 1998 (Anon., pers. comm.). Villagers are generally hostile to-

wards wild dogs and traditional authorities decide whether or not to kill wild dogs, even without MINEF's permission (Breuer 2002). The Lamido of Wangai was reported to have given permission to kill one adult wild dog, which had killed a goat (Breuer 2002).

Cable snares are present in the whole study area, especially on trails to waterholes and mayos (Breuer and Mühlenberg in prep. a). It was twice reported that wild dogs were caught in cable snares, and died in both events (Breuer 2002). While following the adult wild dog, the field team passed three places on antelope trails, where snares have been present recently. Trackers saw one injured (right hind foot) adult wild dog in ZIC 13. A spotted hyena was found in a snare in eastern part of FNP (Tiawoun, pers. comm.). One tracker reported that a car hit an adult wild dog on the road from Voko to Wangai in 1998 when he was chasing a Buffon's kob (*Kobus kob*). The animal died and was later consumed in the village (Breuer 2002). The highway between Garoua and Ngaoundere may be a real danger for wild dogs, although road signs were set up to show the importance of wildlife corridors (Breuer 2002). Kuwong (2000) reports that trackers have found one adult wild dog dead in a hole, which was excavated by gold washers. The presence of infectious diseases like rabies and canine distemper virus in free-ranging domestic dogs around villages, and of traditional herdsmen, are possible threats to wild dogs in northern Cameroon (Breuer 2002). Kuwong (1999) showed that domestic dogs around FNP are sero-positive for rabies (8%), canine distemper virus (22%) and have many parasites. The interview study in 1999 showed that domestic dogs are present in all investigated villages with an average of 16 dogs/village (Bene Bene et al. 1999).

The loss of wildlife habitat due to livestock grazing, agriculture and firewood off-take and the decline of prey species, mostly caused by poaching, present common conservation problems in northern Cameroon (Breuer 2002, Breuer and Mühlenberg in prep. a) limiting the potential for increase of the wild dog population (Fuller and Sievert 2001).

The diet of wild dogs, lions and spotted hyenas in northern Cameroon overlaps substantially (>90%), which indicates high feeding competition (Breuer and Mühlenberg in prep. b). Buffon's kob, which depends permanently on water, is the most consumed prey species and large carnivores are mainly concentrated along watercourses (Breuer and Mühlenberg in prep. b). Interspecific competition around denning areas is also possible. Hyena and lion densities in northern Cameroon are unknown (Mills and Hofer 1998, Bauer et al. 2001), but seem to be very low (pers. obs.), so that interference competition at kills might be rare (Creel and Creel 2002). No direct killing of wild dogs by lions was reported. Bene Bene et al. (1999) have assumed that lions are more concentrated in national parks because of trophy hunting, and that wild dogs therefore avoid the national parks.

Discussion

The estimation of population size through identification of each individual wild dog is very time-consuming, and can only be done during long-term studies. It is only possible in open habitat with good access and infrastructure (Gros et al. 1996). Assessing population size with this method has only worked successfully in Kruger NP with the help of more than 5,000 photographs (Maddock and Mills 1994).

The results from this study provide additional information on wild dog distribution in northern Cameroon, but cannot replace the region-wide survey done by Bene Bene et al. (1999). Some areas were not surveyed. Most information comes from FNP and surrounding areas, and from missions of WWF staff to areas east of BNP and from BNNP.

Interview studies have provided good results on cheetahs (*Acinonyx jubatus*), which are also wide-ranging and live at low densities (Gros 1998, 2002). Collecting information on wild dog sightings and distribution will be crucial for their survival in northern Cameroon. Ideally, questionnaires need to be distributed among hunting guides, before a survey starts. Hunting guides and their clients must be asked to provide photographs taken during the hunting season. Leaflets with pictures of

wild dogs should be distributed to inform the villagers and local authorities (lamidos) of declining wild dogs, and ask for co-operation. They can supply information on all direct (numbers, age classes, sex ratio) and indirect observations, as well as presence of Fulani herdsmen.

Problems of a small wild dog population

The three national parks and their adjoining ZICs with an area of more than 30,000km² are principally large enough to hold a viable population of a wide-ranging species like the African wild dog. However, the project area is not continuous wildlife habitat, as villages, cultivation, and nomadic herdsmen in the habitat fragments interrupt it. Population viability analysis has shown that wild dogs are extremely resilient and can buffer a lot of disturbances (Woodroffe et al. 1997). But not only the total number of remaining wild dogs, but also their spatial distribution is essential for the survival rate of the population. Wild dogs in northern Cameroon live at very low densities and are effectively isolated, due to large distances to other protected areas with wild dog populations, thus limiting the potential of recolonisation and recovery.

Influences of small pack size

Packs of more than 30 wild dogs were often seen during the 1980s (Bene Bene et al. 1999, Jacquet, pers. comm.). Average pack size in northern Cameroon has dramatically declined in the last three decades, and large packs of more than 30 wild dogs have not been observed within the last 20 years. Many solitary wild dogs have been sighted, and the largest pack size recorded was 15. The advantages of large packs are widely documented. Small pack size can have an enormous influence on breeding success, population viability and food intake (Courchamp and Macdonald 2001, Creel and Creel 2002). Obligate co-operators like the African wild dog depend on helpers generating inverse density dependence at the pack level, yielding an Allee effect (Courchamp et al. 2002). This has consequences at the pack level and at the population level, magnifying the effects of human and other threats to wild dogs.

Recommendations

As Creel and Creel (2002) have pointed out, wild dog populations smaller than 100 individuals are facing a “substantial risk of extinction within 100 years” (p. 308). It is essential to develop and test appropriate management strategies for the recovery of wild dogs in northern Cameroon (Breuer 2002). Funds are urgently needed to establish a wild dog conservation project with a policy of conservation through action and education. Co-existence between carnivores and humans can only be achieved with involvement of local people (Sillero-Zubiri and Laurenson 2001). Awareness campaigns through discussions, leaflets, posters and stickers can help to inform the nomadic herdsman, hunting guides, traditional authorities and the local population on the alarming status of wild dogs (Breuer 2002).

Continuous reports of sightings are necessary for the monitoring of the wild dog population in northern Cameroon. More information on wild dogs is needed in Z9 and other areas where wild dogs were seen previously, and also south of BNNP. The area around the Tchabal Mbabo mountain on the Adamawa-Plateau, 100km south-west of FNP, should be searched for wild dogs to confirm earlier signs. Reported sightings of wild dogs in the Mbere valley in the extreme southeast of the protected area system need to be confirmed (Breuer 2002).

Bounties should be set out before the denning season to increase information. High-intensity surveys should be carried out where wild dogs are reported to den, but particular care must be taken not to cause stress to the dogs around dens where they are most vulnerable (Breuer 2002). Given the fact that populations in decline have poor pup survival (Creel and Creel 2002), every effort should be made to protect wild dogs during the denning period.

All possible causes of death must be investigated and every effort should be made to increase wild dog survival. Regular patrols to remove cable snares should be undertaken, especially around wild dog dens and areas of high prey density. To limit road kills, road signs should be erected at wild dog crossing places. The circumstances under which livestock is killed by carnivores must be known, in order to suggest management strategies to

reduce livestock losses (Breuer and Mühlenberg in prep. b). Attempts to minimize livestock losses should be made in collaboration with local people, herdsman and local authorities, using traditional methods to refine husbandry practices (Woodroffe 2001). Simple depredation strategies include improved vigilance by herdsman and enclosures at nights (Breuer 2002).

Ecological relationships between the carnivores must be known in order to make conservation efforts more successful concerning both predator and prey density (Creel et al. 2001, Breuer and Mühlenberg in prep. b). More information on their natural antagonists will answer questions about wild dogs’ ecological role in the large carnivore guild (Breuer 2001).

Active conservation measurements for wild dogs will not only help this endangered species, but can have positive effects for the whole habitat and its wildlife. Laws must be enforced, anti-poaching activities and regular monitoring must be carried out to protect wild dogs’ habitat and prey. Habitat loss and fragmentation must remain low, because of wild dogs’ wide-ranging behaviour. The integrity of large protected areas must be maintained, and corridors (if not already existing) must be established to maximise contiguity of national parks. The results obtained during this study enforce the importance of the wildlife area between FNP and BNP and possibly between BNP and BNNP concerning wild dog migration. Recently, the people of Djonge village agreed to build a new village at the border of ZCB in order to make the wildlife corridor free from human presence. The Lamido of Rey Bouba has proposed a corridor for wildlife between Z9 and Z10. Such efforts should be highly promoted and can be especially helpful in contiguity of the national parks. Ideally a cross-border park with Gashaka Gumti NP should be established, where wild dogs occur. Recent efforts of establishing a trans-boundary protected area of Gashaka-Gumti NP and Tchabal Mbabo area south of FNP are important developments for species that range across park borders (GEF 2001).

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