

CHAPTER 4

Attitudes of ranchers towards African wild dogs *Lycaon pictus*: conservation implications on private land

4.1 Introduction

Due to their position at the top of the food chain, large carnivores (>5 kg) are less common than their prey species, require large areas with sufficient prey, and tend to come into conflict with human interests, creating unique problems for their conservation (Sillero-Zubiri & Laurenson 2001). Spatial and temporal variation in the persistence of large carnivore species is primarily a function of variation in human willingness to tolerate, and ability to kill such species (Woodroffe 2000). State sponsored eradication campaigns caused the extirpation of several large carnivore species from major portions of their natural range (Breitenmoser 1998; Berg 2001). For example, during the late 1800s and early 1900s federal money was used to support professional hunters using traps, poisons and aerial hunting to kill carnivore species such as wolves *Canis lupus* and cougars *Felis concolor* in North America (Linnell et al. 2001). Today, persecution by humans is still the greatest source of mortality for many large carnivore species occurring both outside and inside protected areas (Woodroffe & Ginsberg 1998).

Variation in attitudes of people towards large carnivores appears to be based partly upon the extent to which different species conflict with human interests, and partly upon

inherent human prejudices (Kellert 1985). Wild canids, in particular, seem to engender dislike. In North America, although bears *Ursus arctos* are traditionally popular and perceived to be 'worthy' of conserving, wolves and coyotes *Canis latrans* are among the least liked animals (Kellert 1985; Berg 2001). In Africa, wild dogs have suffered from similarly negative perceptions and fare poorly in the public eye relative to other species (Fanshawe et al. 1991). A killing method sometimes used – ripping at the abdomen to disembowel prey has resulted in wild dogs being described as 'cruel', while other misconceptions include the suggestion that wild dogs regularly kill more than they need, and that they 'terrorise' their prey (Mills & Nel 1993; Woodroffe & Ginsberg 1999). In the past, naturalists have further contributed to negative perceptions by using phrases such as 'murderous', 'destructive', 'rapacious', 'abomination', 'unnecessary creature', 'hound of hell', 'killing wantonly', 'far more food than they need', and 'utmost cruelty' to describe wild dogs and their behaviour (Maugham 1914; Bere 1955; Hunter 1960; Alexander 1986). Antagonism towards wild dogs was reflected in state policies in some countries, and they were killed as vermin in protected areas in at least four southern African nations until as late as 1975 (Creel & Creel 2002). Although state-sponsored persecution has ceased, many of the myths surrounding wild dogs persist, and promote continued persecution of the species outside protected areas. Rasmussen (1999), for example, contends that ranchers have "an intrinsic loathing of wild dogs" and put "prejudice before rationality".

Several life history traits predispose wild dogs to conflict with humans. First, they are wide ranging and so packs are liable to move out of protected areas (Mills 1991;

Woodroffe & Ginsberg 1998), partially because they avoid areas with high densities of lions *Panthera leo* (Mills & Gorman 1997). Secondly, they are diurnal, highly visible, and relatively fearless, increasing the likelihood of lethal encounters with humans (Frank & Woodroffe 2001). Finally, their obligate cooperative breeding system is vulnerable to an Allee-effect at low pack sizes (Courchamp & Macdonald 2001), which increases the impact of persecution by humans.

Persecution by humans in conjunction with habitat destruction has been responsible for a major reduction in the numbers and geographic range of wild dogs, and the current world population is estimated to number as few as 3000 individuals (Fanshawe et al. 1997). In South Africa, range reduction was particularly marked, and wild dogs are presently restricted to a single viable population occurring in the Kruger National Park (henceforth referred to as "Kruger"). Current conservation efforts in South Africa have focused upon the creation of a meta-population through the reintroduction of wild dogs into a series of isolated reserves (Mills et al. 1998). Prior to the establishment of the proposed transfrontier parks, future expansion of the distribution of wild dogs in South Africa is likely to depend increasingly upon reintroductions into privately owned reserves, and through the conservation of naturally occurring wild dogs *in situ* on ranchland, due to a relative shortage of suitable state-protected areas.

A shift in land use patterns across much of southern Africa from cattle ranching to game ranching has created large areas of potentially suitable habitat for wild dog conservation. In parts of Zimbabwe, wild dogs have re-colonised parts of their former range on private

land (Pole 1999; Rasmussen 1999), and resident packs have become established on private land in several parts of South Africa (Chapter 2). The success of conservation efforts involving wild dogs or other carnivores outside state-protected areas is, however, entirely dependent upon the willingness of people to tolerate their presence.

Understanding the attitudes of private land managers towards wildlife is a vital step in the establishment of conservation projects (Newmark et al. 1994), and in North America for example, several studies have gauged opinions prior to the onset of carnivore conservation initiatives (Lohr et al. 1996; Pate et al. 1996). In this study the attitudes of southern African ranchers towards wild dogs were assessed to determine the conditions under which conservation initiatives might succeed and to identify ways in which conflict might be reduced.

4.2 Methods

Sampling was conducted in three parts of South Africa, and three parts of Zimbabwe in which wild dogs are known to occur on private land (Childes 1988; Skinner & Smithers 1990; Fanshawe et al. 1997; Maddock 1999; Pole 1999), yielding a total sample of 211 ranchers. In South Africa, rancher's attitudes were sampled at the following sites (approximate central co-ordinates in parentheses): northern Kwa-Zulu Natal (n = 26, 27° 30' S, 31° 45' E); the western Kruger border (n = 82, 24° 10' S, 30° 55' E); and the Limpopo Valley (n = 58, 22° 20' S, 29° 40' E); hereafter referred to as eastern, northeastern and northern South Africa, respectively. In Zimbabwe, rancher's attitudes

were sampled in the Save Valley Conservancy ($n = 15$, $20^{\circ} 05' S$, $32^{\circ} 00' E$), in and adjacent to the Gwayi River Conservancy ($n = 19$, $18^{\circ} 40' S$, $27^{\circ} 10' E$), and in the Matetsi ranching area ($n = 11$, $18^{\circ} 26' S$, $26^{\circ} 07' E$).

In South Africa, focal areas of wild dog activity were demarcated with the assistance of nature conservation representatives, and a list of ranch names obtained for each site from 1 / 250 000 maps. Variation in sample sizes between sample sites reflects variation in the number of ranches lying within the demarcated focal areas of wild dog activity. Contact details for ranchers were derived from telephone directories. In each area, as many ranchers as possible were interviewed in a two-week period. In Zimbabwe, ranching communities were smaller and an attempt was made to contact all of the ranchers in each area.

At all sample sites, ranch owners or managers were interviewed in person, with the exception of the few cases (<5%) where ranches were too remote for access by car, in which case telephonic interviews were conducted. Respondents were informed that the University of Pretoria was conducting the project, and assured that all responses would remain anonymous. Universities are often seen as a neutral body, encouraging honesty and reducing compliance bias (Mitchell & Carson 1989). The refusal rate was <3%.

Respondents were interviewed with a structured questionnaire (Appendix B). Pre-testing was conducted on ranchers in Zimbabwe prior to the study, to ensure that all questions were clear and understandable, and a final version was prepared for sampling. The

questionnaire was divided into three components. (1) a 'Ranch Characteristics' section, concerning ranch characteristics relevant to wild dogs: property size; fencing characteristics; land use; severity of poaching and whether or not the ranch was part of a collaborative nature reserve. Collaborative Nature Reserves (CNRs) or conservancies are private nature reserves composed of multiple adjacent properties with internal fencing removed, and surrounded by a single perimeter game fence (Lambrechts 1996). (2) A 'Predators' section, concerning the occurrence of, and attitudes towards six species of mammalian carnivore. (3) A 'wild dogs' section concerning the occurrence of wild dogs and attitudes towards them.

4.2.1 Statistical analysis

The relationship between rancher's attitudes and species (black backed jackals *Canis mesomelas*, cheetahs *Acinonyx jubatus*, leopards *Panthera pardus*, lions, spotted hyaenas *Crocuta crocuta* and wild dogs) was investigated using ordinal logistic regression, based upon answers to question 12 (Appendix B). Attitudes towards each species (question 12, Appendix B) were categorised as negative (scores 0 - 1), neutral (scores 2 - 3), or positive (scores 4 - 5). The relationship between rancher's attitudes towards wild dogs, and four ranch characteristics was also analysed using ordinal logistical regression. Attitude towards wild dogs, as the dependent variable, was categorised as negative or positive based upon responses to question 17 (Appendix B). Four categorical independent variables were included. 1) Geographic region - ranches were categorised as eastern, northeastern or northern South African, or Zimbabwean. The Zimbabwean ranches were included as a single category due to low sample sizes. 2) Part or not part of a CNR -

ranches were classified as being isolated, or part of a CNR. 3) Ranch size - ranches were categorised as small (0 – 1,450 ha), medium (1,451 – 4,200 ha) or large ($\geq 4,201$ ha), yielding three categories with approximately equal numbers of samples. 4) Land use - ranches were categorised into four groups on the basis of land use: a) cattle; b) cattle / consumptive wildlife utilisation; c) consumptive wildlife utilisation alone; and d) where ecotourism was a land use (alone or in conjunction with consumptive wildlife utilisation), or where the maximisation of economic benefits was not a priority.

4.3 Results

Mean ranch size (\pm S.E.) was 3,290 (\pm 742) ha in eastern South Africa, compared to 3,185 (\pm 529) ha in northern South Africa, and 2,865 (\pm 497) ha in northeastern South Africa. In South Africa, ranches were typically surrounded by perimeter game fencing (Table 4.1), and in eastern (43.8% electrified, 55% meshed), and northeastern South Africa (51.3% electrified, 3.0% meshed), fencing was frequently electrified or meshed, both of which reduces access to wild dogs (Hofmeyr 2000). In northeastern and eastern South Africa 48.2% and 23.0% of ranches belonged to CNRs, compared to 0% in northern South Africa. CNRs varied in size from 2,500 – 65,000 ha in northeastern South Africa, and 4,500 – 20,000 ha in eastern South Africa. Consumptive utilisation of wildlife was prevalent at each South African site. Livestock ranching was common in northern (39.0% of ranches had livestock) and eastern South Africa (49.9% of ranches), while ecotourism was common in both northeastern (32.5% of ranches) and eastern South Africa (27% of ranches, Table 4.2).

Table 4.1 The percentage of ranches with various fencing characteristics (number of ranches in parentheses)

	ESA ^a (n=26)	NESA ^b (n=82)	NSA ^c (n=58)	Gwayi ^d (n=19)	Matetsi ^d (n=11)	Save ^d (n=15)
No fencing	0	0	1.8	15.8	38.0	5.3
Perimeter cattle fencing	15.0	0	12.7	15.8	18.0	0
Partial perimeter game fencing	25.0	16.0	10.9	68.4 ^e	0	94.7 ^e
Perimeter game fencing	60.0	84.0	76.4	0	45.0	0
Electrification	43.8	51.3	12.0	0	27.2	0
Mesh fencing	55.0	3.0	2.4	0	0	0
Ranches part of CNRs ^f	23.0	48.2	0	94.7	0	100

^a Eastern South Africa.

^b Northeastern South Africa.

^c Northern South Africa.

^d The Zimbabwean sample sites.

^e The outer perimeter fence of a large collaborative nature reserve.

^f Collaborative nature reserves.

Table 4.2 The percentage of ranches with various land uses (number of ranches in parentheses)

Land use	ESA ^a (n=26)	NESA ^b (n=82)	NSA ^c (n=58)	Gwayi ^d (n=19)	Matetsi ^d (n=11)	Save ^d (n=15)
Cattle	3.9	17.5	26.0	0	9.1	0
Cattle / CWU ^e	46.0	11.2	13.0	10.6	0	0
CWU	19.2	10.0	31.5	31.5	54.5	46.7
CWU / ecotourism	3.9	11.2	18.5	21.1	18.2	53.3
Ecotourism	23.1	21.3	5.5	36.8	18.2	0
None	3.9	28.8	5.5	0	0	0

^a Eastern South Africa.

^b Northeastern South Africa.

^c Northern South Africa.

^d Zimbabwean sample sites.

^e Consumptive wildlife utilisation.

Individual ranches were larger in Zimbabwe ($11,105 \pm 1,370$ ha; mean \pm S.E.) than in South Africa ($3,047 \pm 236$ ha; Mann Whitney; $T = 6860.5$; $p < 0.0001$), with land uses based primarily upon the consumptive utilisation of wildlife, and ecotourism (Table 4.2). CNRs in Zimbabwe were also larger (Save Valley - 360,000 ha; Gwayi River - 92,000 ha; cf. 4,500 - 65,000 ha in South Africa). Ranches belonging to CNRs typically had partial fencing (on the outer boundary of the CNR), whereas Zimbabwean ranches not part of CNRs were often unfenced (50.0% of ranches), with few single ranches having electric fencing (21.4%).

All predators were more commonly seen on Zimbabwean than South African ranches (Table 4.3). Wild dogs were regularly sighted on 91.1% of Zimbabwean ranches, compared to 30.8%, 19.6% and 3.8% of ranches in northeastern, northern and eastern South Africa respectively. Rancher's attitudes towards the six carnivores differed between species ($\chi^2 = 51.39$, $df = 5$, $p < 0.0001$). Based upon answers to Question 12 (Appendix B), wild dogs (2.71 ± 0.15 ; mean score \pm S.E.), followed by lions (2.82 ± 0.15) were the least popular species (Figure 4.1). Leopards (3.87 ± 0.12), and black backed jackals (3.57 ± 0.11) were the least unpopular species. Spotted hyaenas (3.24 ± 0.13) and cheetahs (3.35 ± 0.13) were of intermediate popularity. Attitudes towards all predators, and particularly wild dogs and lions, were polarised. For wild dogs and lions, a similar proportion of ranchers denoted scores of zero (very negative: wild dogs 30.7% of ranchers; lions 30.6%) and five (very positive: wild dogs 39.4% of ranchers;

Table 4.3 The percentage of ranches on which various predator species are 'regularly sighted'

Species	ESA ^a (n=26)	NESA ^b (n=82)	NSA ^c (n=58)	Gwayi ^d (n=19)	Matetsi ^d (n=11)	Save ^d (n=15)
Black-backed jackal <i>Canis mesomelas</i>	100	91.5	98.2	100	100	100
Cheetah <i>Acinonyx jubatus</i>	15.4	58.4	57.1	47.4	81.8	93.3
Leopard <i>Panthera pardus</i>	65.4	86.6	78.6	95.1	100	100
Lion <i>Panthera leo</i>	11.5	48.2	5.4	78.9	73.2	40.0
Spotted hyaena <i>Crocuta crocuta</i>	38.5	79.3	39.3	100	100	73.3
Wild dog <i>Lycaon pictus</i>	3.8	30.8	19.6	84.2	81.8	100

^a Eastern South Africa.

^b Northeastern South Africa.

^c Northern South Africa.

^d Zimbabwean sample sites.

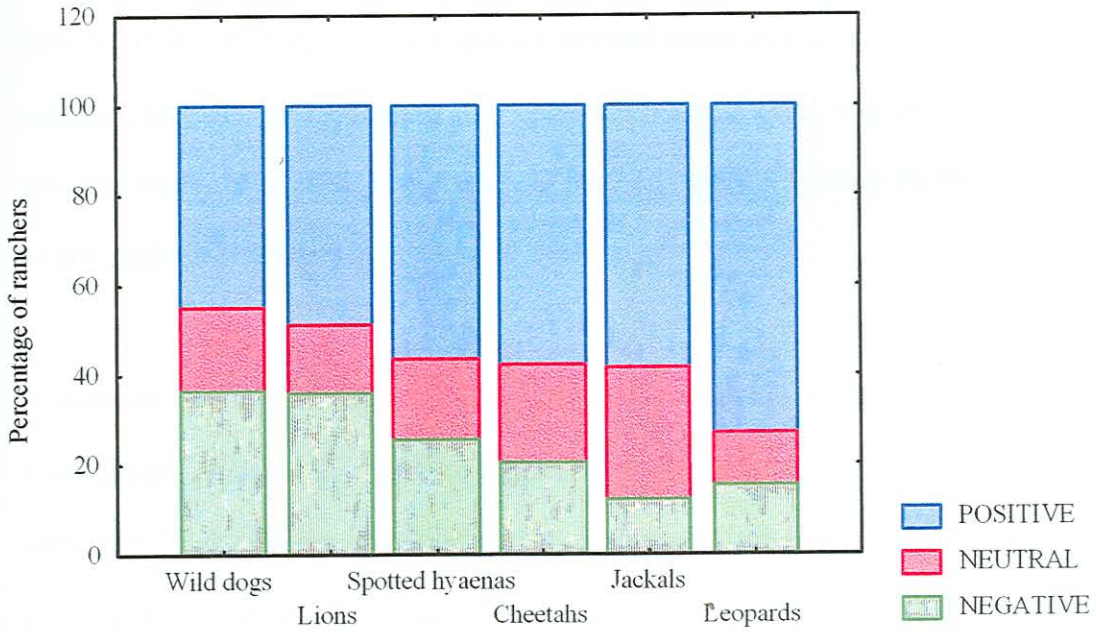


Figure 4.1 Percentage of ranchers who gave negative (scores 0-1), neutral (scores 2-3) and positive (scores 4-5) towards various carnivore species (in response to question 12, Appendix B)

lions 42.1%). The other carnivore species received fewer zero scores (jackals 10.1% of ranchers; leopards 13%; cheetahs 18.6%; spotted hyaenas 21%), with most ranchers denoting scores of five (leopards 62.8% of ranchers; spotted hyaenas 46.4%; cheetahs 44.6%; jackals 41.2%).

In question 12 (Appendix B), ranchers were asked to provide reasons for their attitudes towards each predator. The most common reasons for negative attitudes towards wild dogs were “they affect my income” (13.5% of ranchers), “they kill a lot / too much game” (13%), “they kill livestock” (12%), and “the ranch is too small for them” (10.1%, Table 4.4). Most of these comments were more commonly applied to wild dogs than to any other species. Two comments were made almost exclusively of wild dogs “they chase game and make it wild” (10.6% of ranchers), and “they chase game into fencing during hunting” (6.2%). Overall, 3.7% of ranchers indicated that they would shoot wild dogs on their property (compared to 1.9% - 3.4% for the other species). Discussion with local nature conservation representatives however, suggests that the proportion of ranchers who actually do shoot predators is greater than suggested by the survey results. Interestingly, only 2.3% of ranchers mentioned that they consider the method of hunting used by wild dogs as being cruel, and <1% of ranchers were negative towards wild dogs simply out of a dislike for the species.

The most common reasons for negative attitudes towards cheetahs were “they kill a lot / too much game” (12.5% of ranchers), and “they kill livestock” (6.3%). Almost five percent of ranchers (4.8% of ranchers) complained that cheetahs “waste food”, a

Table 4.4 The ten most common reasons for negative and positive attitudes towards six carnivore species

Reasons given for attitudes	Wild dogs	Cheetahs	Jackals	Leopards	Lions	Hyaenas
Negative comments						
They affect income / have no value	13.5	1.9	3.4	2.0	2.9	4.3
They kill a lot of / too much game	13.0	12.5	10.1	2.5	9.1	7.2
They kill livestock	12.0	6.3	6.3	8.7	15.1	11.5
They chase game and make it wild	10.6	1.4	0	0	0	0
The ranch is too small for them	10.1	2.4	0	1.1	9.1	1.0
They chase game into fences	6.2	0	0	0	0	1.0
I will shoot them if I see them	3.7	1.9	1.9	2.4	3.4	1.9
There are too many of them	1.0	0	0	0.5	0	1.0
I don't like them	0.5	0	0	0	0	6.3
They pose a risk to human safety	0	0	0	0.5	5.8	0
They kill for the sake of it / waste meat	0	4.8	0	0	1.1	0
Positive comments						
Their value for ecotourism	21.6	16.3	13.5	22.1	19.6	19.7
Their ecological role / part of the system	13.5	18.3	24.0	13.9	11.6	19.7
Because they are few / only pass through	12.5	5.3	0	4.9	0	4.8
To assist with their conservation	7.2	1.9	0.5	0	1.1	0.5
I like them / they are nice to see	5.8	10.0	2.9	7.7	6.8	4.8
They are no problem / don't kill too much	3.9	12.5	21.0	22.5	3.9	16.8
They are OK if their numbers are managed	3.8	0	9.0	2.9	3.4	0
Their value for trophy hunting	0	0	2.9	8.7	8.2	2.4
They are a valuable species	0	0	0	3.9	3.9	1.0
They make a nice sound	0	0	3.4	0	0	1.9
They clean the bush of carcasses	0	0	7.0	0	0	7.2

complaint rarely levelled at other species. Most common reasons for negative attitudes towards leopards, spotted hyaenas and lions were that “they kill livestock” (8.7%, 11.5%, 15.1% of ranchers, respectively). For lions, 9.1% of ranchers were negative because they felt that the ranch was too small, and 5.8% of ranchers were negative because they felt that lions were a threat to human safety. For spotted hyaenas, 6.3% of ranchers were negative because they “don't like the species”, a reason rarely given for negativity towards the other species.

The most common reason given for positive attitudes towards wild dogs was “their value for ecotourism” (21.6% of ranchers), and more ranchers recognised the ecotourism value of wild dogs than of spotted hyaenas (19.7%), lions (19.6%), cheetahs (16.3%), or jackals (13.5%). Fourteen percent (13.5%) of ranchers were positive towards wild dogs because of “their ecological role”. Two reasons for positive attitudes towards wild dogs were rarely given to other species: “because they only pass through” (12.5% of ranchers); and “because they are endangered / to assist their conservation” (7.2%).

Ecotourism value and “their ecological role” were common reasons for positive attitudes towards all species, while “their value for hunting” was a reason for positive attitudes towards leopards (8.7% of ranchers) and lions (8.2%). A common reason for positive attitudes towards cheetahs (12.5% of ranchers), spotted hyaenas (16.8%), jackals (21.0%), and leopards (22.5%) was that “they are not a problem / don't kill too much”, a reason rarely given for positive attitudes towards wild dogs (3.9%) or lions (3.9%).

Several ranchers were positive towards spotted hyaenas (7.2%) and jackals (7.0%) because “they clean the bush of carcasses”.

Ranchers were asked to indicate whether they agree or disagree with a number of statements pertaining to wild dogs: 93.7% of ranchers agreed that “wild dogs are a natural component of a healthy ecosystem”; 12.0% agreed that “wild dogs regularly kill more food than they require”; 61.4% agreed that “wild dogs cause disruption of game herds and make them more skittish”; 41.5% agreed that “wild dogs cause damage to fencing during hunting”; 52.2% agreed that wild dogs are “a liability to a rancher because they consume valuable wildlife but provide no economic return”. Although 92.8% of ranchers agreed that “tourists are interested in seeing wild dogs”, only 42.7% believe that “sufficient money can be made from marketing ‘wild dog eco-tours’ to compensate for the losses caused by their predation”. Significantly, however, of ranchers who previously indicated that they do not want to have wild dogs on their property, 55.5% indicated that the demonstration of a way in which to derive sustainable profit from wild dogs would be sufficient incentive for them to want the species on their property.

4.3.1 Relationship between attitudes and ranch characteristics

In response to question 17 (Appendix B), 52.3% of ranchers indicated that given a choice they would like to have wild dogs on their property, the remainder stating that they would rather not have wild dogs on their land. Rancher’s attitudes varied significantly with variation in several ranch characteristics ($\chi^2 = 79.4$, $df = 9$, $p < 0.0001$), permitting identification of conditions likely to be unfavourable for wild dog conservation,

conditions in which wild dog conservation may be possible given public relations exercises and / or wild dog ecotourism schemes, and the conditions likely to be favourable for wild dog conservation without intervention by conservationists (Figure 4.2). Ranchers were most positive ($p=0.0194$) in eastern South Africa (69.2% of ranchers were positive), followed by Zimbabwe (66.6%), northeastern South Africa (58.5%), and northern South Africa (24.1%). In eastern South Africa, 64,537 ha of land sampled (75.5% of total), consisted of land managed by people who wanted wild dogs on their property, compared to 213,176 ha (68.9% of total) in northeastern (excluding three CNRs with open borders with Kruger), and 70,441 ha (39.4% of total) in northern South Africa. Ranchers belonging to a CNR were more positive ($p=0.0065$) than ranchers whose properties were isolated (75.6% of ranchers were positive c.f. 38.8%). Ten percent of negative ranchers indicated that they will be positive towards wild dogs when "we form a CNR with neighbours / start ecotourism operations". Attitudes also varied with land use ($p<0.0001$) - cattle ranchers were least positive (16.1% of ranchers were positive), followed by ranchers combining cattle ranching with consumptive use of wildlife (32.0%), ranchers deriving income primarily from consumptive wildlife utilisation (40.4%), and finally by ranchers involved in ecotourism or who did not utilise their property to maximise economic benefits (74.0%). Attitudes were not influenced by ranch size ($p=0.384$).

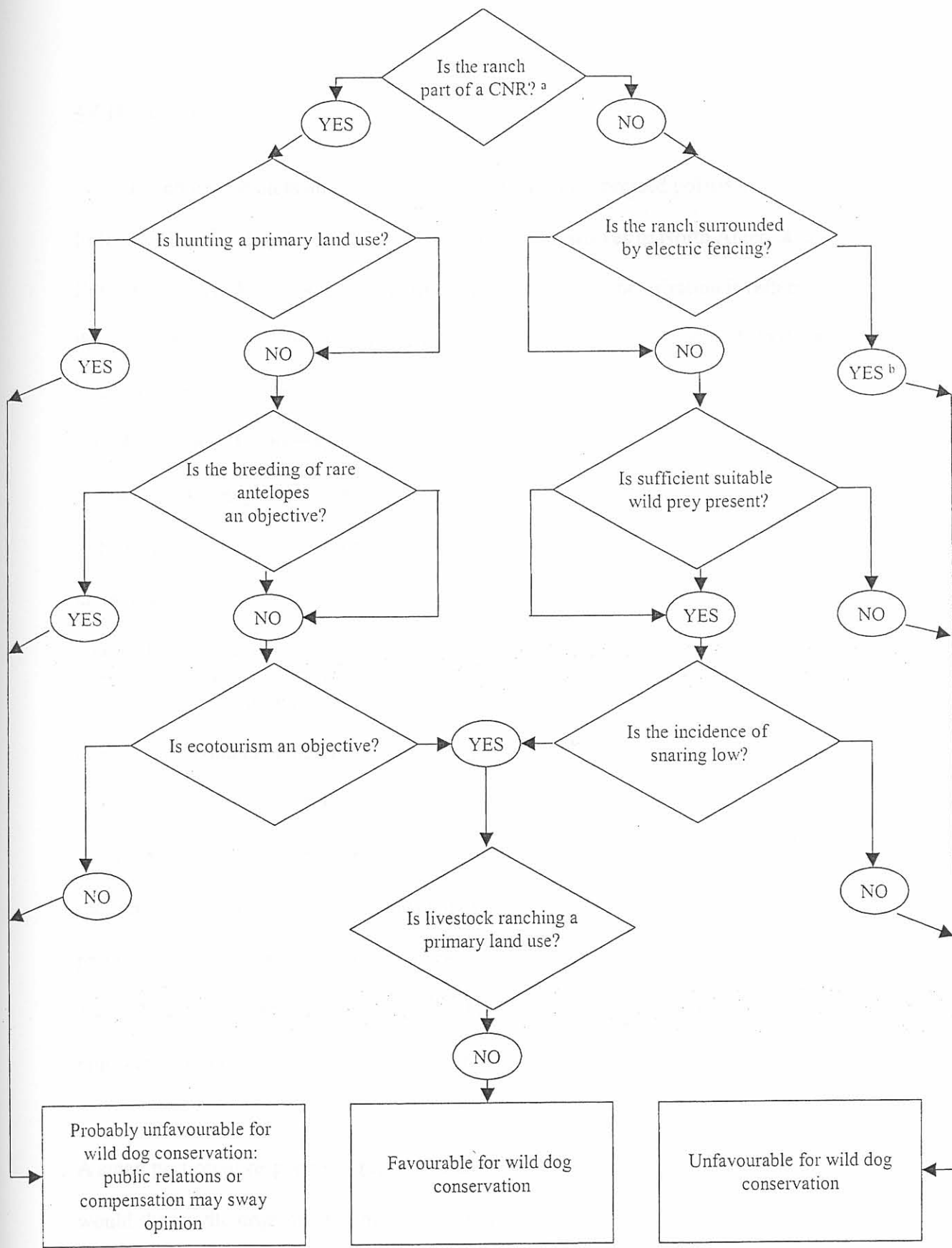


Figure 4.2 General conditions under which wild dog conservation on private land is most likely to succeed

^a Collaborative nature reserve.

^b Where fencing prevents wild dogs from accessing a property.

4.4 Discussion

Wild dog conservation is an emotive topic, and ranchers expressed polarised views with little middle ground, in keeping with public opinion on wolves in North America and Europe (Bangs & Fritts 1996; Zimmerman et al. 2001). This polarisation is reflected in the contrast between comments made by positive ranchers, for example: “Wild dogs are endangered and enhance the value of the area”; “We will guard them with our lives”; “Wild dogs appeal to tourists more than lions”; “I love them as animals and they are great for guests”, and negative ranchers, for example: “I shoot first and then ask questions”; “The game goes totally wild when wild dogs are on the property”; “It is not just the animals they kill, they also chase game through the fences”; “Wild dogs have no value, and hunting substitutes their ecological role”. Wild dogs are the least popular large carnivore species among ranchers, while leopards and black backed jackals are popular due to their economic value through ecotourism and hunting, and low perceived threat, respectively. In line with this, (Bowler 1991) found that wild dogs were the least popular species among Zimbabwean ranchers and leopards the most popular. Southern African ranchers, in contrast to their Kenyan counterparts (Frank & Woodroffe 2001), were not particularly negative towards spotted hyaenas, and many ranchers acknowledged their “ecological role” and their importance in “cleaning the bush of carcasses” (26.9% of ranchers) and their value for ecotourism (19.7%).

A small portion of respondents (3.7% of ranchers) indicated without prompting that they would shoot wild dogs on their property irrespective of the species’ legal status, and reported incidents of persecution are common (Chapter 2). Land outside protected areas

in South Africa is highly fragmented through the conversion of natural habitat, high human densities and the presence of high-speed roads (Chapter 2). The effect of negative ranchers, is to further fragment natural habitat by creating a mosaic of areas in which wild dogs are protected, and areas in which they are persecuted. By virtue of their obligatorily cooperative breeding system, wild dogs are intolerant of persecution (Courchamp & Macdonald 2001). Although wild dogs continue to survive in ranching areas in several parts of South Africa, they inhabit at most 22.2% of the potentially suitable available habitat (Chapter 2), and it is likely that the minority of negative ranchers seriously limits the survival of wild dogs on private land.

4.4.1 Conditions conducive to conflict between wild dogs and ranchers

The most common reasons provided for negativity towards wild dogs are based upon economic costs associated with their presence, and attitudes are likely to be negative under land use conditions where predation by wild dogs causes economic loss. Cattle ranchers often complained that wild dogs harass and / or kill livestock, whilst many game ranchers complained that wild dogs kill ungulates that could be utilised for hunting or live capture and sale. More ranchers complained about the impact of wild dogs on wild ungulates than about any other carnivore species. Ranchers whose properties were surrounded by perimeter fencing, and not part of CNRs also tended to be negative. Under these conditions, ranchers frequently complained “wild dogs disrupt wildlife during hunting and make it wild”, a longstanding complaint held by managers towards wild dogs (Creel & Creel 2002). Under natural conditions, this is not the case, and calm returns rapidly to prey following pursuit by wild dogs (Creel & Creel 2002). However, fencing surrounding small ranches is likely to impede the ability of prey to escape, and as a result

prey occurring within fenced areas may be chased for longer (before the dogs give up), or more frequently, both of which may increase prey stress-levels. Many ranchers with fenced properties also complained that wild dogs chase wildlife into game fences, causing damage to, and the loss of wild ungulates through the fencing. Experience from the reintroduction of wild dogs into medium sized reserves (500 km² – 650 km²) suggests that wild dogs use fencing as a tool during hunting (Hofmeyr 1997; van Dyk & Slotow 2003), and this tendency is likely to be exacerbated in small, fenced game ranches.

4.4.2 Strategies to improve rancher's attitudes

The few studies considering the economic costs of large carnivores on rangeland in Africa have suggested that losses due to predation are insignificant relative to other sources of mortality (Mizutani 1993; Rasmussen 1999). Potential economic costs of predation by wild dogs on game ranches in South Africa are high (Chapter 5), however, suggesting that negative attitudes are not entirely without foundation. The negative effect of costs due to wildlife upon the attitudes of local people towards conservation is well established (Infield & Namara 2001; Walpole et al. 2001), and consequently, reducing costs and creating benefits from the conservation of wild dogs represents the most effective way in which attitudes might be improved.

Research into the behavioural ecology of wild dogs under game and livestock ranching conditions is needed to assess economic losses resulting from predation relative to other causes. Rasmussen (1999), for example, found that landowners exaggerated the impact of wild dogs upon cattle and showed that appropriate stock management could greatly

reduce losses. Research is also required to assess potential ecological benefits conferred by the presence of wild dogs under game ranching conditions, and it is important to determine the extent to which predation by wild dogs is compensatory, resulting in the death of animals that would have died anyway. Pole et al. (in prep.) for example, showed that wild dogs select for the least fit animals. Wild dogs may also prevent over population of impala *Aepyceros melampus*, which may be detrimental to more sensitive (and more valuable) species such as sable *Hippotragus niger* and roan antelope *Hippotragus equinus*. It is important that these potential benefits are quantified so that landowners consider the positive ecological impact of wild dogs, in addition to economic costs. Research is also required to dispel (or otherwise) the idea that wild dogs disrupt prey populations more than other predators as a result of their cursorial hunting technique. Although this suggestion is largely rejected by scientists (Mills & Nel 1993; Creel & Creel 2002), the prevalence of this belief among ranchers suggests that evidence is required to prove that wild dogs do not have this effect in fenced game ranches.

Fifty six percent (55.5%) of negative ranchers indicated that a way in which to generate sustainable profit from wild dogs would be sufficient incentive for them to want wild dogs on their properties. Wild dogs are popular among tourists (Fanshawe et al. 1991; Davies 1998; Chapter 5) and the financial benefits of wild dog-based ecotourism are predicted to be sufficient to offset the costs of their conservation in game ranching areas under most conditions (Chapter 5). Where feasible, conservation efforts on private land should focus on encouraging and assisting landowners to establish wild dog-based ecotourism ventures. However, although the market for specialised ecotourism is rising

with increasing numbers of tourist arrivals to South Africa, tourism is highly susceptible to political instability and it would be unwise to promote wild dog conservation solely on the basis of tourism-related incentives (Sillero-Zubiri & Laurenson 2001). Education programmes, aimed at installing a conservation ethic and reducing misconceptions about wild dogs represent an important additional strategy. For example, 12% of ranchers are under the mistaken impression that wild dogs regularly kill more food than they need to survive. Wild dogs live on a metabolic knife edge as a result of their hunting technique and high daily energy expenditure (Gorman et al. 1998), and as a result, simply cannot afford to waste energy on catching prey other than that required to eat. An education programme bordering Venetia-Limpopo Nature Reserve in northern South Africa yielded assurances that wild dogs leaving the reserve will not be shot (H. Davies pers. comm.).

Finally, encouraging ranchers to form or join CNRs is likely to reduce conflict and create conditions conducive to wild dog conservation. Many of the problems associated with conserving wild dogs on private land are absent in CNRs, due to the absence of internal fencing, the presence of larger prey populations, and economic conditions conducive to ecotourism rather than the consumptive utilisation of wildlife (Barnes & de Jager 1996). Ranchers surveyed within CNRs tended to view wildlife as a communal resource and were less aggrieved by the loss of wild ungulates to predators. Ten percent of ranchers negative towards wild dogs indicated that they will be more positive towards wild dogs when a CNR is formed in their area, or when they start ecotourism operations on their land. CNRs typically have a constitution driving common-decision making concerning wildlife management (Barnes & de Jager 1996; Lambrechts 1996), reducing the

likelihood of ranchers persecuting wild dogs. The goal of many CNRs is to reconstruct intact wildlife communities including predators (Lambrechts 1996). Consequently, CNRs provide realistic sites for the reintroduction of wild dogs and / or suitable habitat for natural re-colonisation. The suitability of CNRs for wild dogs (and large predator conservation in general) was reflected in the higher rates of occurrence of wild dogs (and other carnivores) on Zimbabwean ranches (wild dogs frequently sighted on 91.1% of ranches), relative to South African ranches (frequently sighted on 22.7% of ranches). Almost seventy percent (68.8%) of ranches sampled in Zimbabwe were part of CNRs, compared to 28.3% of ranches sampled in South Africa. A graphic example of the suitability of CNRs comes from Save Valley Conservancy in southeastern Zimbabwe, which was re-colonised by wild dogs in the early 1990s, and now has a population estimated at over 100 individuals (A. Pole pers. comm.).

4.4.3 Potential for private land to contribute to wild dog conservation

Over half (52.3%) of ranchers interviewed would like to have wild dogs on their properties. Attitudes are largely positive under conditions in which the costs associated with wild dogs are low, and / or where they are beneficial to economic objectives. Conservation efforts are most likely to succeed where eco-tourism is a primary land use, on properties where economic benefits are not maximised as a management objective, and within CNRs. In keeping with this, 21.6% of ranchers recognised wild dogs as being 'draw cards' for tourism, and several ranchers (13.5%) also recognised the "ecological role" of wild dogs. Furthermore, in addition to recognition of the utilitarian role of wild dogs, 5.8% of ranchers were positive because of their aesthetic appeal. Several ranchers

(7.2% of ranchers) acknowledged the conservation significance of wild dogs on their land, and some expressed a keenness to assist actively in conservation efforts in their area through monitoring, and in helping prevent wild dog persecution by other ranchers.

Conservationists and researchers tend to view ranchers as an obstacle to wild dog conservation (Fanshawe et al. 1991; Rasmussen 1999). Although much needs to be done to improve attitudes and reduce persecution, this view may be unduly pessimistic. In Africa, the last two decades has seen an increase in community based wildlife management schemes in communally owned areas neighbouring protected areas, and game ranching on private land, and there is an increasing awareness that people are part of the solution to conservation problems outside protected areas (van der Waal & Dekker 2000; du Toit 2002). Contrary to previous beliefs, my study suggests that ranchers in southern Africa have the potential to act as important facilitators in the conservation of wild dogs. At present, an estimated 76 wild dogs, in 17 packs and dispersing groups occur outside protected areas in South Africa, primarily on private game ranchland (Chapter 2). There are an estimated 4,000 game ranches in South Africa, covering 80,000 km², compared to the 28,000 km² under the control of South African National Parks Board (Hearne & Mackenzie 2000). Assuming the same proportion of ranchers are positive towards wild dogs countrywide, as was recorded in the South African sample sites (52.3% of ranchers), then up to 41,840 km² of game ranch land is potentially suitable for wild dog conservation. Assuming that wild dogs would reach the lowest density (16.7 dogs / 1000 km²) observed in Kruger (Maddock & Mills 1994), given adequate protection, this area is potentially capable of supporting ~ 699 adults, or ~ 70

packs. Although some of this land area is likely to be unsuitable for wild dog conservation because of habitat fragmentation or unsuitable land uses, there is nonetheless significant potential for range expansion of wild dogs on private land in South Africa.

The need for increasing the numbers and range of wild dogs in South Africa is evident; the current South African wild dog population numbers as few as 270 individuals (Chapter 2), which yields a demographically effective population size of 213 (Creel & Creel 2002), highly vulnerable to environmental and demographic stochasticity.

Although significant potential exists for expanding the range of wild dogs in the future following establishment of the proposed transfrontier parks (www.peaceparks.org), at present, a shortage of suitable state-owned conservation areas dictates that increasing the South African wild dog population will be partially dependent upon reintroduction into private nature reserves and the conservation of naturally occurring wild dogs *in situ* on private land. For this to succeed, conservation efforts aimed at capitalising on existing goodwill, and improving attitudes among negative ranchers through the reduction of costs and maximisation of economic benefits, are required.

In conclusion, identifying the basis of conflict between humans and predators through social outreach represents a vital tool in the conservation of large carnivores, and is an increasingly common feature of species recovery programmes (Messmer et al. 1999).

The findings of my study suggest that although much needs to be done to improve the attitudes of a minority of ranchers who persecute wild dogs, significant potential exists for conserving wild dogs on private land in South Africa. To date, this potential has been

largely unrecognised. In keeping with findings relating to human-elephant *Loxodonta africana* conflict (Messmer et al. 1999), no single measure can be universally applied to reduce conflict, and judiciously tailored conservation plans for specific areas are required to promote coexistence across a broad spectrum of ranching conditions. Conservation efforts in areas dominated by ecotourism should be based primarily upon the provision of technical assistance for the establishment of wild dog-based ecotourism. Efforts in areas dominated by the consumptive utilisation of wildlife and cattle ranching should be based primarily upon education programmes and the reduction of economic costs associated with wild dogs (for example by encouraging the formation of CNRs, or through appropriate livestock husbandry techniques).

4.5 References

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