Chapter 4: Socio-economic correlates and management of leopard-stock farmer interactions in the Baviaanskloof Mega-Reserve

4.1 Introduction

According to Woodroffe & Ginsberg (1998), human-carnivore conflict is the most important cause of adult carnivore mortality. This causes potent edge effects in the areas surrounding reserves, which ultimately leads to local extinctions of carnivore populations (Woodroffe & Ginsberg 1998). One of the main reasons for human-carnivore conflict is livestock predation by carnivores (Graham *et al*. 2005). The loss of livestock represents an economic loss to farmers, not only in terms of direct losses of livestock but also in terms of the increased costs and work effort in adapting farming methods (Sekhar 1999; Kaczensky *et al*. 2004). Studies documenting the economic value of livestock lost to carnivores are few. However, the resultant economic losses are large enough to make livestock farming adjacent to nature reserve unprofitable. These losses and the lack of involvement of governmental institutions (e.g. compensation schemes, predator management, education, etc.) leave farmers with no other alternative except retaliatory killing of the carnivores (Graham *et al*. 2005; Mishra 1997). Thus, effective conservation of carnivores requires the resolution of carnivore-stock farmer conflict (Woodroffe *et al*. 2005).

In order to resolve the conflict between farmers and carnivores, the socio-economic factors that influence the attitudes of farmers towards carnivores need to be addressed. One of the major contributing factors is the economic loss endured by livestock farmers, which often results in negative attitudes towards carnivores (Breitenmoser 1998). This has severe consequences in terms of conservation of carnivores within reserves and on privately owned lands (Woodroffe & Ginsberg 1998). The attitudes of land managers towards carnivores and conservation in general vary according to the local socio-economic environment. Several studies (Naughton-Treves *et al*. 2003; Kaczenskey *et al.* 2004) on attitudes towards carnivores have shown that variables such as age, gender, education, income, living on a farm, proximity to reserve, religious and cultural factors influence the perceptions and attitudes of land managers to carnivores.

Here, the various socio-economic factors that influence the attitudes of farmers in the BMR towards leopards were assessed. The two broad hypothesis tested are that the attitudes of

farmers towards leopards are influenced by perceived stock losses, and that the attitudes of farmers are influenced by tourism activities as the leopard may provide an alternate source of income to the farmer. The effectiveness of various livestock management techniques and predator control strategies employed by livestock farmers in the BMR was also assessed.

4.2 Methods

4.2.1 Surveys Instrument

Data were collected during the survey of landowners reported in Chapter 3. In addition to questions related to the ecological correlates of carnivore-stock conflict discussed in Chapter 3, respondents were also asked to supply socio-economic information. Information regarding the socio-economic aspects of carnivore-stock interactions was divided into the following five sections (see Appendix 1):

i. Personal information

This section focused on the socio-demographic characteristics of the respondents. These variables were divided into categories to ease analysis, and included information on property size (small < 1 000 ha; medium 1 001 – 5 000 ha; large > 5 000 ha), the number of years respondents have been farming their properties (experience: low < 6 years; medium 6 – 15 years; high >15), and whether they reside on the farm or in a nearby town (residence).

ii. Farming type

This section focused on the characteristics of the livestock owned by the respondents, and included information such as the total number of livestock owned, the number of types of livestock (breeds) owned (diversity of livestock: low < 3; medium 3 – 5; high > 5), and the dominant type of livestock owned (dominant livestock).

iii. Management of livestock

Management of livestock incorporates the stock management strategies used by the farmers to curb stock losses. This section included a set of specific questions addressing the various livestock management techniques such as kraaling stock at night, lambing/kidding in protected areas, use of Anatolian dogs, use of shepherds, use of electric fencing, etc. These questions were very specific (e.g. “Do you have electric fences?” or “When do most leopard-stock incidents occur?”), and provided several options from which respondents could select their

response. The responses to these questions were assigned numerical values to allow for statistical analysis. This section also incorporated an open-ended question, e.g. "Have you adapted your farming methods due to predation risk?". The responses to this question where grouped into similar classes e.g. 1 = responses related to lambs/kids, 2 = responses related to ewes, and 3 = responses related to safer lambing areas etc., which facilitated statistical analysis.

iv. Predator control strategies

This section focused on the various predator control strategies used by respondents in order to reduce livestock predation by carnivores. The techniques used are hunting of predators, cage traps, gin traps, hunting dogs, poison baits/lures, protective collars, and poison collars. Respondents were asked to rate the effectiveness of each technique used (three classes: very effective, moderately affective, or not effective). They were also asked to provide information on frequency of use (Are the predator control techniques used as preventative measures or only when livestock is killed?), and how many leopards were killed per year by each method.

v. Attitudes towards leopards

Here, the attitudes of respondent towards leopards ("Do you enjoy seeing leopards on your farm?") were measured as well as the tourism ("Are leopards of value in a tourism operation?") and ecological significance ("Do leopards control the population size of other "problem species"?") of leopards to farmers. Finally, respondents were asked if they had any tourism initiatives on their properties.

4.2.2 Statistical analysis

All variables measured were shown to be distributed non-normally by the Shapiro-Wilk test, and had unequal variances according to the Levene's test. In the case of the quantitative data, an arcsine transformation did not improve on normality. Non-parametric statistical techniques were thus applied (Zar 1996).

Quantitative data included percentage livestock lost to the various causes of livestock mortality. This was compared to livestock management techniques and predator control strategies in order to assess the effectiveness thereof. This was done via a Mann-Whitney *U* test when only two categories where compared (e.g. comparing stock losses between respondents staying on the farm and those that reside in town), and a Kruskal-Wallace ANOVA on ranks and

a *post-hoc* Tukey-type test for multiple comparisons. The *Z*-adjusted *p*-level was used in cases where the categorical $N < 20$ (Zar 1996).

The attitudes of respondents towards leopards were compared to various variables. These included: the socio-demographic attributes of respondents, the characteristics of their livestock, tourism initiatives, the tourism and ecological usefulness of leopards to farmers, whether farmers would rather farm or practice eco-tourism, and the total stock losses and stock losses attributed to leopards. This was analysed by employing a Pearson's chi-squared test statistic. Here, log-linear analysis was used to analyse these categorical variables. The Yates correction factor was used for small degrees of freedom (Zar 1996).

4.3 Results

4.3.1 Management of livestock

The management technique most widely used by the respondents was lambing in safer areas (70%, Figure 4.1). This was followed by the retraction of all livestock from areas bordering the BNR (23%), kraaling livestock at night and using shepherds (18%), improvement of border fences (15%), using electric fences (13.7%), and finally the use of Anatolian shepherd dogs (11%). A total of 17 respondents removed their livestock from the areas bordering the BNR.

The lesser used techniques included changing livestock type (10%), managing non-breeding adults in areas bordering the BNR (8%), rotation of livestock (7%), restore natural prey of predators (7%), ram permanently with the ewes (4%), farmer spends more time in the veld (4%), lambs checked every day (4%), reduce stock number (1%), reduce flock number (1%), change lambing season (1%), and use smaller camps (1%).

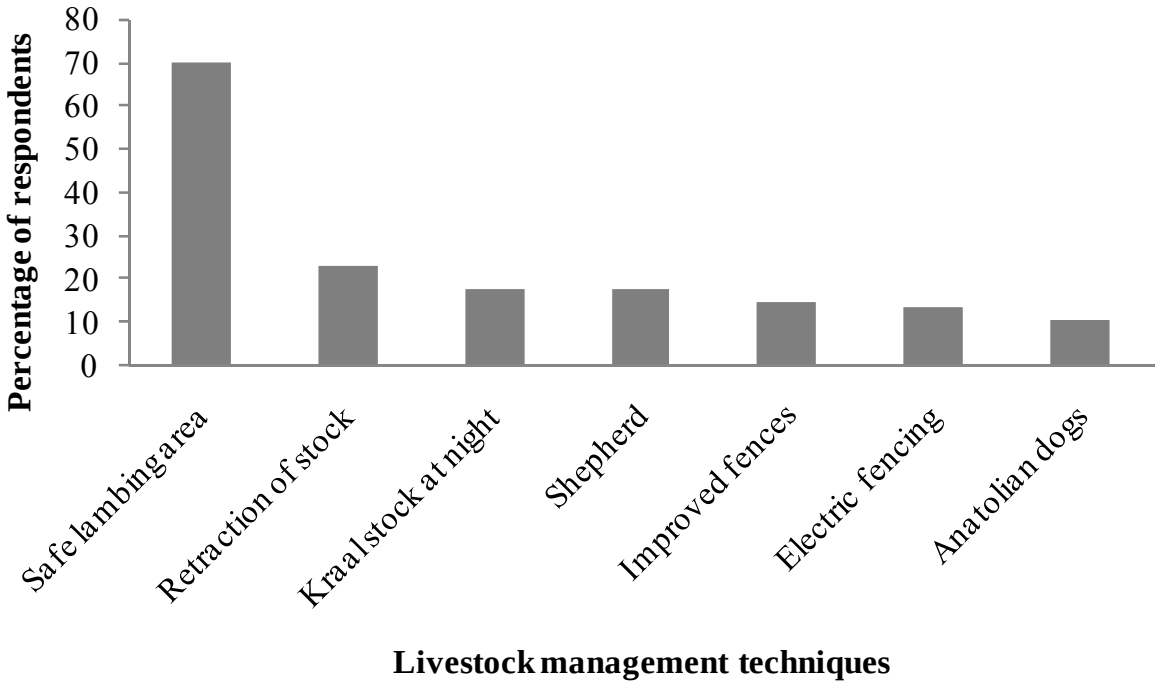

Figure 4.1: The dominant livestock management techniques used by respondents to reduce livestock predation by carnivores.

Livestock management techniques were compared to the various causes of livestock mortality (Table 4.1). Most management responses had no clear relationship with the causes of livestock mortality. The retraction of livestock (Figure 4.2) from the areas bordering the reserve was significantly related to leopard predation (Table 4.1). Stray dog predation had a significant relationship with kraaling livestock at night (Table 4.1). Employing shepherds was significantly related to Cape fox (*Vulpes chama*) predation, and mongoose predation (Table 4.1). All of the management techniques that had a significant relationship with the causes of livestock mortality were used in response to high predation levels. Thus, none of these techniques was effective in reducing livestock predation by carnivores.

Table 4.1: The effectiveness of livestock management techniques used to reduce livestock predation.

Causes of livestock mortality	Management responses						
	Safe lambing area [a]	Anatolian dogs [a]	Retraction of stock [a]	Improved fences [a]	Kraaling stock at night [b]	Shepherd [b]	Electric fence [b]
Black-backed jackals	440.50 [ns]	214.00 [ns]	424.50 [ns]	226.00 [ns]	3.58 [ns]	3.91 [ns]	1.84 [ns]
Caracals	492.00 [ns]	258.00 [ns]	415.00 [ns]	338.50 [ns]	3.88 [ns]	0.92 [ns]	0.50 [ns]
Leopards	471.50 [ns]	226.00 [ns]	286.50*	274.00 [ns]	3.96 [ns]	1.19 [ns]	0.91 [ns]
Stray dogs	440.00 [ns]	190.50 [ns]	456.00 [ns]	293.50 [ns]	8.04 *	2.46 [ns]	0.32 [ns]
Baboons	548.00 [ns]	231.00 [ns]	382.00 [ns]	319.00 [ns]	4.32 [ns]	3.56 [ns]	4.21 [ns]
Unknown	494.50 [ns]	192.50 [ns]	368.00 [ns]	307.50 [ns]	4.84 [ns]	1.04 [ns]	1.51 [ns]
Bushpigs	531.00 [ns]	176.00 [ns]	425.00 [ns]	308.00 [ns]	1.40 [ns]	0.62 [ns]	0.18 [ns]
Cape foxes	531.00 [ns]	244.00 [ns]	400.00 [ns]	255.00 [ns]	0.90 [ns]	11.94 **	0.63 [ns]
African wild cats	546.50 [ns]	252.00 [ns]	459.00 [ns]	315.50 [ns]	0.44 [ns]	5.99 [ns]	0.32 [ns]
Mongooses	550.00 [ns]	256.00 [ns]	467.50 [ns]	335.50 [ns]	0.22 [ns]	8.12 *	0.16 [ns]
Birds	483.50 [ns]	219.50 [ns]	336.50 [ns]	324.50 [ns]	1.78 [ns]	0.56 [ns]	3.00 [ns]
All	471.50 [ns]	245.50 [ns]	359.00 [ns]	269.00 [ns]	0.79 [ns]	3.44 [ns]	2.38 [ns]

a = Mann-Whitney *U* test statistic, b = Kruskal-Wallace ANOVA *H* test statistic. ** Significant at the $p < 0.01$ level, * Significant at the $p < 0.05$ level, ns = not significant.

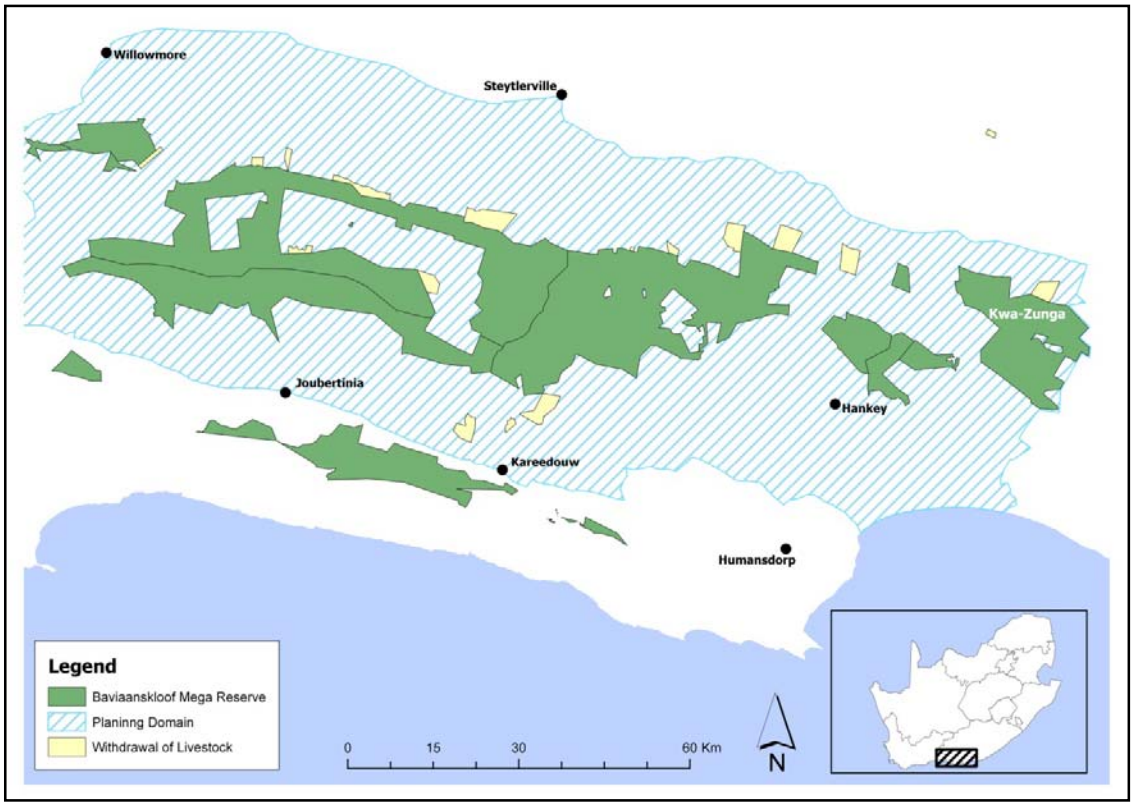

Figure 4.2: Areas where farmers have withdrawn their livestock due to leopard predation.

4.3.2 Predator control strategies

The most frequently used (24.6%) predator control strategy was hunting of carnivores (Figure 4.3). This is followed by cage traps (20.2%), gin traps (18.7%), hunting dogs (15.8%), poison bait (9%), protective livestock collars (7%), and poison livestock collars (1%).

Three percent of respondents did not practice any predator control strategies at all. Of the respondents (n = 6) who did not use any predator control techniques, only one respondent had zero stock losses, three respondents had 4% stock losses and the other two had 49% and 23% total stock losses, respectively.

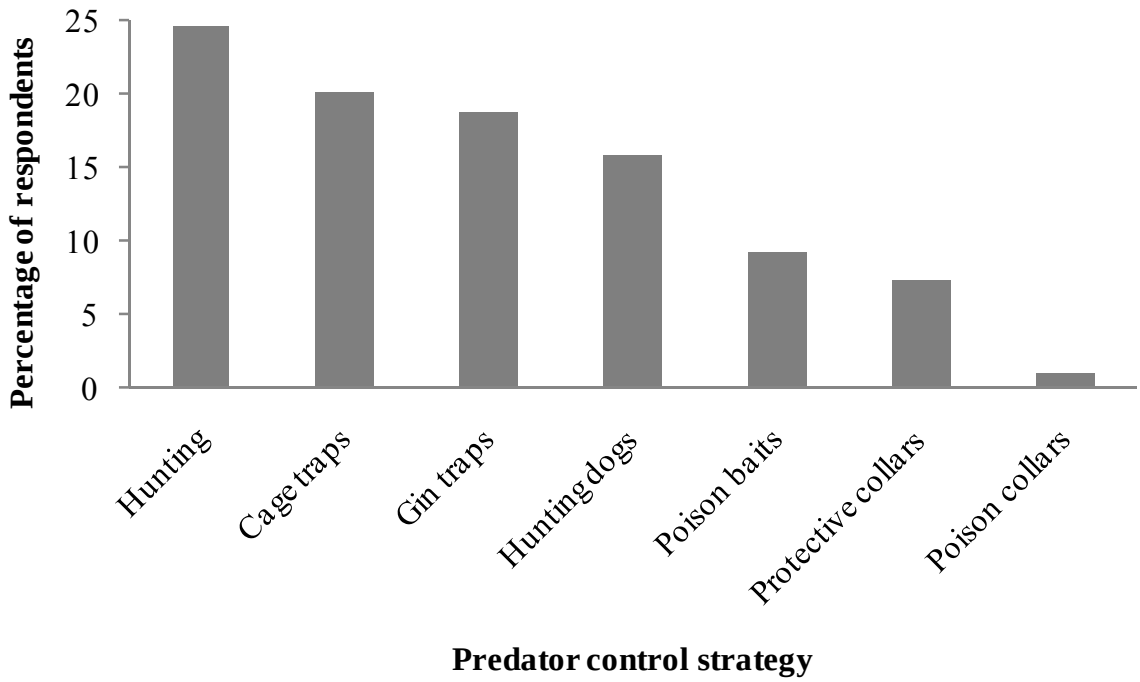

Figure 4.3: Percentage of respondents that use specific predator control strategies.

The predator control techniques were compared to the various causes of livestock mortality in isolation (Table 4.2). Most predator control strategies had no clear relationship with the causes of livestock mortality. Livestock losses attributed to black-backed jackals were significantly affected by hunting (Table 4.2), gin traps (Table 4.2), and poison bait (Table 4.2). Predation by birds had a significant relationship with the use of cage traps (Table 4.2). Total livestock losses were affected by hunting (Table 4.2), cage traps (Table 4.2), gin traps (Table 4.2), and poison baits (Table 4.2). Once again, all the management techniques that had a significant relationship with the causes of livestock mortality were used in response to high predation levels. Thus, none of these techniques was apparently effective in reducing livestock predation by carnivores.

Respondents had varied opinions regarding the effectiveness of these predator control strategies. According to the respondents, only hunting was found to be a significantly effective method in controlling or reducing carnivore predation ($\chi^2 = 10.08$, $p = 0.006$).

Sixty-six percent (66%) of respondents tend to use these control strategies as preventative measures, whilst 34% of farmers use these methods only when stock is lost.

Table 4.2: Results of the statistical analysis of the effectiveness of predator control strategies used to reduce livestock predation.

Causes of livestock mortality	Predator control strategies						
	Hunting	Cage trap	Gin trap	Hunting dog	Poison bait	Protective collar	Poison collar
Black-backed jackal	185.5 **	500.5 ^{ns}	295.5 **	632.0 ^{ns}	266.0 **	343.0 ^{ns}	16.5 ^{ns}
Caracal	508.0 ^{ns}	516.5 ^{ns}	560.0 ^{ns}	569.0 ^{ns}	408.0 ^{ns}	434.5 ^{ns}	50.0 ^{ns}
Leopard	484.0 ^{ns}	500.0 ^{ns}	563.0 ^{ns}	560.0 ^{ns}	462.0 ^{ns}	413.0 ^{ns}	47.0 ^{ns}
Stray dog	562.0 ^{ns}	588.0 ^{ns}	653.5 ^{ns}	605.5 ^{ns}	509.5 ^{ns}	424.5 ^{ns}	46.0 ^{ns}
Baboon	535.0 ^{ns}	554.5 ^{ns}	566.5 ^{ns}	589.5 ^{ns}	476.5 ^{ns}	406.0 ^{ns}	51.0 ^{ns}
Unknown	522.0 ^{ns}	500.0 ^{ns}	585.0 ^{ns}	637.5 ^{ns}	484.0 ^{ns}	362.0 ^{ns}	67.0 ^{ns}
Bushpig	542.0 ^{ns}	632.0 ^{ns}	666.0 ^{ns}	561.0 ^{ns}	498.0 ^{ns}	408.0 ^{ns}	65.0 ^{ns}
Cape fox	529.0 ^{ns}	628.0 ^{ns}	664.0 ^{ns}	605.0 ^{ns}	475.0 ^{ns}	391.0 ^{ns}	67.0 ^{ns}
African wild cat	561.5 ^{ns}	651.5 ^{ns}	630.0 ^{ns}	609.0 ^{ns}	494.0 ^{ns}	420.0 ^{ns}	69.0 ^{ns}
Mongoose	563.5 ^{ns}	635.5 ^{ns}	647.5 ^{ns}	630.0 ^{ns}	503.5 ^{ns}	427.5 ^{ns}	70.0 ^{ns}
Birds	534.0 ^{ns}	407.0 **	551.5 ^{ns}	519.5 ^{ns}	402.0 ^{ns}	421.5 ^{ns}	28.0 ^{ns}
All	394.0 *	455.0 *	421.0 **	555.5 ^{ns}	251.5 **	411.0 ^{ns}	33.0 ^{ns}

** Significant on the $p < 0.01$ level, * Significant on the $p < 0.05$ level, ns = not significant.

4.3.3 Attitudes towards leopards

The majority (67.2%) of respondents had a negative attitude towards leopards (Table 4.3). Thirty-seven percent of farmers did have some form of tourism initiative on their properties. However, the presence of tourism initiatives did not influence the perceptions of farmers towards leopards ($\chi^2 = 0.70$, $p = 0.402$). When respondents were asked if they would rather farm or run ecotourism operations, a significant proportion (56%) of farmers with negative attitudes towards leopards would rather farm ($\chi^2 = 11.58$, $p = 0.0007$). Seventy-four percent of respondents believed that leopards have a tourism value. However, this did not significantly affect the attitudes of farmers towards leopards ($\chi^2 = 3.83$, $p = 0.147$). Forty-nine percent (49%) of land managers believed that leopards do not influence other carnivore species in terms of inter-specific social dominance. This had a significant and a negative effect on the attitudes of the respondents ($\chi^2 = 7.62$, $p = 0.022$).

The attitudes of respondents were then compared to total stock losses (Figure 4.4) and stock losses attributed to leopards (Figure 4.5). Forty-nine percent of respondents had a negative attitude towards leopards and high total stock loss. However, the attitudes of farmers towards leopards was not affected by the number of total stock lost ($\chi^2 = 5.87$, $p = 0.118$). The reverse was true when the attitudes of respondents towards leopards were compared to the number of livestock losses attributed to leopards. Forty-nine percent of land managers had a negative attitude towards leopards, but had zero stock lost to leopards in the last three years of farming. This relationship was also not significant ($\chi^2 = 2.99$, $p = 0.393$).

Table 4.3: The attitude of respondents towards leopards and the relationship of various response variables with attitudes.

Variable	Response	Percentage of respondents (n)	Relationship with attitude towards leopards (χ^2)
Attitude towards leopards	Positive	32.8% (24)	n/a
	Negative	67.2% (49)	
Tourism initiative on farm	Yes	37.0% (27)	0.70 ^{ns}
	No	63.0% (46)	
Farm or ecotourism	Farm	69.9% (51)	11.58 **
	Ecotourism	30.1% (22)	
Leopard tourism potential	Yes	73.9% (54)	3.83 ^{ns}
	No	24.7% (18)	
	Don't know	1.4% (1)	
Leopards control other predators	Yes	49.3% (36)	7.62 *
	No	30.1% (22)	
	Don't know	20.6% (15)	

** Significant on the $p < 0.01$ level, * Significant on the $p < 0.05$ level, ns = not significant.

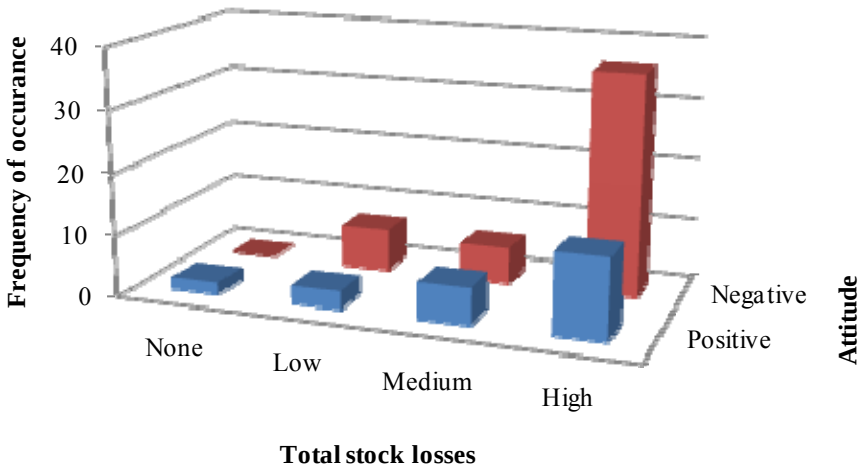

Figure 4.4: The affect of total stock losses on the attitudes of respondents towards leopards.

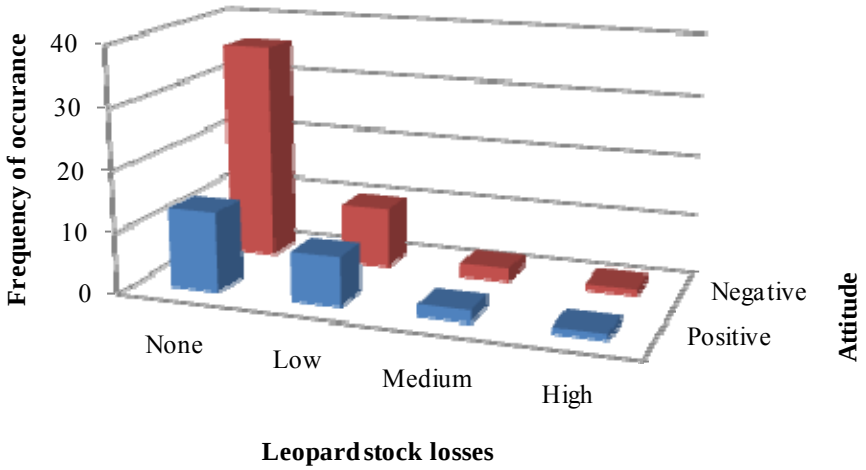

Figure 4.5: The affect of stock losses attributed to leopards on the attitudes of respondents towards leopards.

4.3.4 Socio-demographic composition

A total of 73 farmers provided data for this survey. Respondents managed a total of 267 678 ha. The average farm size was 3 667 ha (range 34 – 12 680 ha). Property size did not affect the attitudes of respondents towards leopards ($\chi^2 = 2.83$, $p = 0.243$). Most respondents (89%) had farmed on their current properties for more than five years. The amount of years spent farming on the property (experience) did not significantly affect the attitudes of respondents towards leopards ($\chi^2 = 0.65$, $p = 0.721$). Ninety-three percent (93%) of the respondents resided on their farms, whereas 7% stayed in nearby towns. Place of residence did not significantly affect the attitudes of respondents towards leopards ($\chi^2 = 0.20$, $p = 0.652$).

4.3.5 Characteristics of livestock

The number of livestock and game owned ranged from 83 to 11 300 animals (mean = 1 917) and had no significant relationship with the attitudes of respondents towards leopards ($\chi^2 = 0.24$, $p = 0.889$). The majority (95.9%) of respondents' livestock comprised smallstock (sheep and goats). Respondents owned on average three different breeds of livestock (range 1 – 6), which was dominated by Dorper sheep (41.1% of respondents), Angora goats (21.9%), and wool Merino sheep (17.8%). Diversity of livestock did not significantly affect the attitudes of respondents towards leopards ($\chi^2 = 3.45$, $p = 0.178$). However, the dominant livestock on the property was significantly related to the attitudes of respondents towards

leopards ($\chi^2 = 16.43$, $p = 0.022$). Respondents who owned predominantly Dorper sheep had a negative attitude towards leopards.

4.4 Discussion

4.4.1 Socio-demographic composition

Socio-demographic variables have been shown to affect the attitudes of farmers towards carnivore conservation (Naughton-Treves *et al*. 2003). None of the measured socio-demographic variables significantly influenced the attitudes of respondents towards leopards. Therefore, the attitudes of respondents in the BMR towards leopards are affected by other factors.

4.4.2 Characteristics of livestock

The attitudes of respondents towards leopards were significantly ($p = 0.022$) affected by dominant livestock. Respondents who predominantly owned Dorper sheep had a negative attitude towards leopards. This is to be expected, as 41% of the respondents own predominantly Dorper sheep, and 67% of respondents had a negative attitude towards leopards. However, leopards do not cause the largest proportion of sheep mortalities (Chapter 3). Therefore, the negative attitudes towards leopards are driven by other factors, which will be highlighted in the sections that follow.

4.4.3 Management of livestock and predator control strategies

It was not possible to isolate a single, or even a suite of livestock management techniques that significantly reduced the level of predation by certain carnivores. This is because most techniques are used in combination with other techniques. When these techniques were analysed separately few significant associations emerged. This is because livestock management techniques do not affect stock losses due to predators (Graham *et al.* 2005). These techniques are positively correlated with net primary production instead (Graham *et al.* 2005). However, the most important finding was that the majority of respondents with high stock losses attributed to leopards withdraw their livestock from the areas bordering the nature reserve. This translates to 14 367 ha (5.4% of surveyed properties) of privately owned land that is not being farmed (Figure 4.2). The presence of leopards may thus reduce the impacts of livestock on the vegetation and consequently assist in the conservation of biodiversity. These areas have been shown to assist in the conservation of mammals on farmlands (Macdonald *et al*. 2008). However, a landscape-level approach instead of a farm-

level approach is required to address biodiversity conservation on farmlands (Macdonald *et al*. 2008). There is thus the possibility to incorporate these areas into the Baviaanskloof Nature Reserve in order to provide more habitat for leopards. However, this will not necessarily contribute to biodiversity conservation unless these areas correspond with the critical biodiversity areas identified by the Baviaanskloof Mega-Reserve Conservation Plan (see Boshoff *et al.* 2008).

As was the case with the management techniques for livestock, it was not possible to isolate certain predator control strategies that significantly reduced the level of predation by carnivores. However, when these predator control strategies were analysed separately, several significant associations with the causes of livestock mortality were observed (Table 4.2): black-backed jackal predation was associated with the use of hunting ($p < 0.001$), gin traps ($p < 0.001$), and poison baits ($p < 0.001$); predation by birds was associated with the use of cage traps ($p < 0.001$); total stock losses was associated with the use of hunting ($p < 0.005$), cage traps ($p < 0.005$), gin traps ($p < 0.001$), and poison baits ($p < 0.001$). In all these cases, the predation by the relevant predator was greater when the specific technique was applied. These techniques are thus applied as a response to increased predation by carnivores, with 66% of respondents doing so. According to Graham *et al.* (2005), this is understandable because an increased predation risk to livestock leads to an increase in protective measures used by farmers. It seems that none of these techniques significantly reduces the amount of livestock lost to predators. Even though farmers have been using these techniques for years, they are not succeeding in reducing predator-stock conflict in Natal (Lawson 1989). This is a classic example of the lack of evidence-based management. Sutherland *et al*. (2004) found that 77% of management decisions made by conservation officials were based on anecdotal evidence such as common sense, personal experience, and hearsay. There is in all probability, a greater proportion of farmers that manage livestock and predators in this fashion. For this reason, the majority of management techniques are ineffective. It is therefore necessary to use techniques that have been proven to prevent livestock losses rather than "cure" it, as well as education and advice on which techniques to use and how to apply them (Lawson 1989).

4.4.4 Attitudes towards leopards

The majority (67%) of respondents had a negative attitude towards leopards. One of the most important factors influencing the perceptions of farmers towards carnivores is the threat carnivores pose to the livelihoods of farmers (Maddox 2003). Even though there was no significant relationship between the attitudes of respondents towards leopards and the total

amount of stock lost or the stock losses attributed to leopards, an interesting pattern emerges. Respondents with high total stock losses have negative attitudes towards leopards (Figure 4.4). This is however, in no way affected by leopard predation on livestock, because respondents with zero stock losses to leopards still have a negative attitude towards them (Figure 4.5). The hypothesis that farmers with high levels of leopard predation will have a negative attitude towards leopards is therefore not supported. Thus, it is clear that predation by all carnivores plays a major role in the attitudes of farmers towards carnivores, in this case leopards (attitudes towards wolves, Naughton-Treves *et al*. 2003). Consequently, one can expect that any land manager, who experiences livestock predation by carnivores, will have negative attitudes towards other carnivores, even those that do not pose a threat to their livestock. This begs the question: Why do farmers have negative attitudes towards carnivores that do not kill livestock? This is because a large proportion of farmers that experience livestock losses to predators do not want any other potentially damage causing predators on their property, and they will take steps to prevent these carnivores from settling on their properties (Marker *et al*. 2003), as was also the case in Kwa-Zulu Natal (Lawson 1989).

In addition to this, the attitudes of farmers are also significantly affected by their choice of occupation. The majority of respondents (70%) would rather farm than run an eco-tourism operation. This was significantly ($p < 0.01$) related to a negative attitude towards leopards. Here, it was also hypothesized that respondents that have some form of tourism on their properties will have a positive attitude towards leopards. This was not the case, as 63% of respondents did not have any form of tourism on their properties and there was also no significant ($p > 0.05$) relationship between attitudes towards leopards and tourism initiatives. Thus, the hypothesis is therefore not supported (Figure 4.3). Even though most respondents did not have tourism on their properties and would rather farm, 74% still believed that leopards have an economic value in tourism. However, this was not significantly ($p > 0.05$) related to the attitudes of the respondents (Figure 4.3). This pattern was also evident when respondents were asked if leopards control other predators. Forty-nine percent of respondents believed that leopards influence the population size of other carnivores. However, this was significantly ($p < 0.05$) related to negative attitudes towards leopards (Figure 4.3). On the other hand, 30% believed that leopards do not influence other carnivores and 21% did not know if leopards influence other carnivores (Figure 4.3).

It appears that the tourism potential of leopards is undervalued by respondents. Although community based conservation and tourism schemes are important to conservation of carnivores on private lands (Thavarajah 2008), it is not the sole solution to leopard-stock

farmer conflict in the BMR. The fact that most farmers do not know what ecological role leopards play in the ecosystems and the benefits they provide for livestock farming, indicates the necessity of extensive education programmes in the BMR. However, the most important way to change the attitude of farmers towards carnivores is through financial incentives and compensation schemes (Thavarajah 2008). Even though this will not reduce carnivore-livestock conflict, it will increase the tolerance of farmers towards carnivores (Hemson 2003), and substantially improve their attitudes towards carnivores.