



A survey of Montana hunter/rancher problems and solutions  
by Erik Jon Swensson

A thesis submitted in partial fulfillment of requirements for the degree of Master of Science in Range  
Science

Montana State University

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**Abstract:**

A one year survey was conducted in 1995 to identify conflicts between hunters and ranchers in Montana. One-third of the questionnaire was different for the two groups in order to obtain specific information unique to a ranch or individual hunter. Two-thirds of the questionnaire was identical between the groups and presented questions related to perceived problems and solutions, experiences, game populations, importance of private and agricultural land to wildlife, and representation. A questionnaire was mailed to 1000 randomly selected hunters and 989 ranchers. Thirty-five percent of the hunters (N=349) and 42% of the ranchers (N=395) responded to the survey. Sixty-five percent of the hunters surveyed had >10 yr of hunting experience. The top three problems identified by hunters were: too little access to private land, driving off roads, and trespassing. The top three solutions presented by hunters were: greater consideration and appreciation by ranchers, better communication between groups, and better boundary identification. Sixty percent of the ranchers responding own or manage 404 to 4084 ha. The top three problems identified by ranchers were: driving off roads, trespassing and too many hunters. The top three solutions presented by ranchers were: stiffer penalties for violators, better communication between groups, and greater consideration and appreciation by hunters. Both hunters and ranchers ranked driving off roads and trespassing in their top three problems. They also ranked better communication and greater consideration and appreciation in their top three solutions. Hunters and ranchers have different views of who represents them in hunter/rancher related issues. Fifty percent of the hunters responding believe they represent themselves or have no representation regarding hunter/rancher related issues; whereas, 62% of the ranchers responding indicated they are represented by livestock producer groups. Results indicate that hunters and ranchers have similar concerns and better communication will help alleviate conflicting interests.

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APPROVAL

of a thesis submitted by

Erik Jon Swensson

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency and is ready for submission to the College of Graduate Studies.

Dr. James E. Knight

James E Knight  
(Signature)

7-31-96  
(Date)

Approved for the Department of Animal and Range Science

Dr. Mike Tess

M. W. Tess  
(Signature)

7/31/96  
(Date)

Approved for the College of Graduate Studies

Dr. Robert Brown

R Brown  
(Signature)

8/9/96  
(Date)

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## ABSTRACT

A one year survey was conducted in 1995 to identify conflicts between hunters and ranchers in Montana. One-third of the questionnaire was different for the two groups in order to obtain specific information unique to a ranch or individual hunter. Two-thirds of the questionnaire was identical between the groups and presented questions related to perceived problems and solutions, experiences, game populations, importance of private and agricultural land to wildlife, and representation. A questionnaire was mailed to 1000 randomly selected hunters and 989 ranchers. Thirty-five percent of the hunters (N=349) and 42% of the ranchers (N=395) responded to the survey. Sixty-five percent of the hunters surveyed had >10 yr of hunting experience. The top three problems identified by hunters were: too little access to private land, driving off roads, and trespassing. The top three solutions presented by hunters were: greater consideration and appreciation by ranchers, better communication between groups, and better boundary identification. Sixty percent of the ranchers responding own or manage 404 to 4084 ha. The top three problems identified by ranchers were: driving off roads, trespassing and too many hunters. The top three solutions presented by ranchers were: stiffer penalties for violators, better communication between groups, and greater consideration and appreciation by hunters. Both hunters and ranchers ranked driving off roads and trespassing in their top three problems. They also ranked better communication and greater consideration and appreciation in their top three solutions. Hunters and ranchers have different views of who represents them in hunter/rancher related issues. Fifty percent of the hunters responding believe they represent themselves or have no representation regarding hunter/rancher related issues; whereas, 62% of the ranchers responding indicated they are represented by livestock producer groups. Results indicate that hunters and ranchers have similar concerns and better communication will help alleviate conflicting interests.

## CHAPTER 1

### INTRODUCTION

Livestock production in Montana is a one billion dollar industry (Montana Agric. Stat. Serv., 1994). Hunting in Montana provides 333 million dollars of the 2.5 billion dollar tourism industry (Brooks, 1988a; Brooks, 1988b; Christensen et al., 1995). The land area of Montana is 37.6 million hectares and over 24.3 million hectares are agricultural lands. The state of Montana is comprised of 62% privately owned lands, 30% federal lands, 6% state lands and 2% tribal lands. Of the 24.3 million hectares of agricultural lands, the average privately owned farm or ranch size is 1000 hectares. (Montana Agric. Stat. Serv., 1994). Privately owned agricultural lands are important to Montana's economy and recreational opportunities.

Montana hunter/rancher relations have become increasingly strained over the past several years. Hunters are concerned about diminishing access to private and public land for hunting opportunities. Ranchers feel helpless to control increasing wildlife populations and feel their contributions to wildlife habitat are overlooked.

Conflicts between hunters and ranchers in Montana have been escalating in recent years. This trend is occurring throughout the United States. A survey conducted in New Mexico by Knight et al. (1987) found that one obstacle between better hunter/rancher relationships is negative attitudes a small group of hunters and ranchers have toward each

other. Peterson (1992) reported problem solving between hunters and ranchers had become more confrontational and oriented towards single issues.

In order to address hunter/rancher conflicts and solutions, it is first necessary to identify the perceived problems and possible solutions. Three different methods to collect information have been utilized and all have inherent shortcomings. Advocacy group membership surveys are often used to identify problems because members are available and readily give their views. Unfortunately, little effort has been made to determine if they reflect the views of the population as a whole or just the views of an active segment (Sudman, 1981). Public hearings and meetings is another method of identifying problems. Johnson et al. (1993) found that meeting attendees tended to state more extreme views than the general population. The use of questionnaires has been an effective way of getting input representative of an entire population, but because surveys have been aimed at single groups they have not been useful in identifying commonalities between groups (Knight et al., 1987).

The objectives of this study were to identify background characteristics of Montana resident hunters and ranchers and to identify perceived problems and possible solutions between hunters and ranchers.

## CHAPTER 2

### LITERATURE REVIEW

Hunters' and ranchers' views differ on the importance and use of big game species. Hunters enjoy both consumptive and non-consumptive uses of wildlife in a recreational setting. On the other hand wildlife can be a threat to the livelihood and income of ranchers. A review of the literature indicates differing views between the two groups, which can lead to conflicts in management of big game animals.

#### Hunter Experiences

Hunters view big game as a source of recreation and personal enjoyment. Allen (1984) defines hunting as a recreational activity in which people participate within a recreational setting to enable certain types of experiences or satisfactions. Many researchers have tried to classify the types of satisfaction people experience while hunting big game animals. Satisfaction sources have been categorized in three to twelve different dimensions (Potter et al., 1973; Schole et al., 1973; Brown et al., 1977; Hantalouma and Brown, 1978; Kellert, 1978). Satisfaction dimensions of harvest were rated relatively low as detractors to the success of the hunting experience, giving additional credence to the notion that killing game is not the only or necessarily the most important measure of hunter satisfaction (Potter, 1982). Swan (1995) stated that hunting may lead people to peak experiences, from

spectacular environmental settings to intense emotional excitement, and encounters with the deepest issues of life and death. Hunting is a strong tradition for many families in Montana.

### Rancher Experiences

Ranchers often view big game as a source of nuisance and lost income. However, they also realize and appreciate the advantages of healthy wildlife populations. Adkins (1991) found that big game species significantly damaged alfalfa crops during spring and summer seasons in Montana. A study conducted by Conover and Decker (1991) found that farmers and ranchers believe that damage caused by wildlife has increased substantially in the last thirty years. Tolerance of wildlife damage varies with: type, amount and severity of damage; ability to withstand the economic consequences of damage; personal attitudes toward wildlife and the species involved; perceptions of population trends; and attitudes toward hunting (Craven et al., 1992). Under Montana law, landowners must assume the cost of a certain level of wildlife damage (Montana Legislative Council, 1986). Ranchers recognize that wildlife values require not only consideration of the material, economic and commodity benefits, but also the aesthetic, non-consumptive and non-commodity values (Kellert 1981). Any wildlife species or population has both positive and negative values for society (Conover et al., 1995). Bernardo et al. (1994) stated that domestic livestock and wildlife are, at least to some extent, competitive enterprises.

### Wildlife Habitat

Wildlife populations are threatened by increasing human populations leading to development of land for urban and suburban uses (Poelker and Buss, 1972). As early as 1912 scientists were predicting the extinction of elk, deer, bear and wild turkey due to the development of the rich farming areas of the East and Midwest United States (Hornaday, 1913). Although the importance of habitat quality and quantity is recognized, there are few incentives for Montana landowners to ignore potential economic gain derived from subdividing existing farms and ranches (Alexander and Kellert, 1984). Swenson (1983) found that the high level of public use of wildlife, both consumptive and non-consumptive, in Montana has resulted in a high degree of public pride and awareness of wildlife resources. Wildlife is a public resource, owned by all citizens, yet the habitats upon which wildlife depend are not always publicly owned, and wildlife often move freely between publicly and privately owned lands (Cook and Cable, 1992).

A major concern of hunters is access to private land. Increasingly more landowners and ranchers are restricting access to their lands. Land postings decrease recreational, hunting and management opportunities. In a survey of wildlife administrators throughout the United States, Wright and Kaiser (1986) found that areas with the most public land holdings had the greatest concerns for hunter access problems. Wright and Kaiser (1986) also found that misconduct by hunters is believed to be the largest deterrent to landowners allowing access. According to Peterson (1992), landowners feel betrayed by hunter groups who are becoming more politically active and prefer solving issues, like

access, through litigation and legislation. To help address access problems, forty states have hunter access programs of some type (Wigley and Melchior, 1987).

### Land Management

Multiple-use management of land resources for domestic livestock and wildlife is becoming an increasingly important issue on private and public lands (Bernardo et al., 1994). Much of the research conducted concerning wildlife-livestock relationships focused on negative impacts one has on the other. This led to management decisions which restricted use of an area or imposed "either-or" philosophies. Because this type of management often identifies situations that are detrimental to agriculture or wildlife it can lead to confrontational situations (Lacey et al., 1988; Bowen and Kruse, 1993; Wywiałowski, 1994). Leopold (1933) believed that no conceivable system of private preserves and public shooting grounds could adequately accommodate the growing number of urban citizens who like to hunt.

When livestock conflicts are not present, Johnson et al. (1993) stated that two major objectives of wildlife managers are to maintain healthy wildlife populations and provide satisfactory recreation experiences. However, when livestock management and private lands are involved wildlife management becomes more complex. Adkins and Irby (1992) found the willingness of a landowner to tolerate wildlife and wildlife damage may change from year to year based on the market value of the lost crop. This is a factor beyond the control of wildlife managers. Land managers must allow a balance of livestock grazing, wildlife populations and habitats, and hunting pressure in order to achieve an efficient multiple-use



management plan (Matulich and Adams 1987). Management plans must be designed to fit the situation and environment where they are used.

### Questionnaire Design

The design of a questionnaire is important to increase the response rate and to allow for correct interpretation of the questions being asked. Little information is available on using questionnaires to compare opinions of distinct groups on the same issues. When comparing two groups it is important to word the questions identically. Kalton et al. (1978) found that comparisons between groups in terms of their responses to an opinion question is likely to be affected by the difference in the form of the question. Closed-end questions, allowing the respondent to choose among a set of given answers, yields a much higher response than open-ended questions, requiring a written answer (Belson and Duncan, 1962). Using accurate descriptions of location, time and event in the questionnaire can improve the accuracy of the responses. Cannell et al. (1977) found that as the time between an event and the time of questioning increases, there will be increased under-reporting of information about the event. Sudman and Presser (1981) found the opposite; as time increases there is an over-reporting of information about the event. Whether under-reported or over-reported, inaccurate description will increase questionnaire bias.

Establishing credibility is important and can be done through the use of an introductory cover letter attached to the questionnaire. Descriptions explaining the reasons, importance and funding of the project will help to establish credibility and build trust, which in turn will increase rate of response (Fowler, 1993). The use of a pre-survey is important

to test the design of the survey and improve validity (Mendenhall et al., 1971; Filion, 1981). Opinions of non-respondents are as important as those of respondents in testing the validity of the survey (Brown and Wilkins, 1978; Craven, 1992).

### Summary

Understanding the characteristics of the survey respondents allows for identification of the stake holder groups, or those who have the most to lose or gain in a situation. The literature review identified possible stake holders in wildlife and agriculture issues. Perceived conflicts and possible solutions between hunters and ranchers can be identified using survey techniques.

## CHAPTER 3

## MATERIALS and METHODS

A questionnaire designed to identify perceived problems and possible solutions to hunter/rancher conflicts was mailed to 1000 Montana big game hunters and 989 Montana ranchers. Identification of stake holders in hunter/rancher issues were determined to develop appropriate mailing lists. The stake holders for hunter issues were determined to be avid sportsmen in Montana. The stake holders for ranchers were determined to be people depending upon agriculture for their livelihood. Hunters were randomly selected from the Montana Fish, Wildlife and Parks database of deer (*Odocoileus* spp.), elk (*Cervus elaphus*) and antelope (*Antilocarpa americana*) 1994 hunting permit purchasers. One thousand hunters purchasing a resident combination license for deer and elk and hunters who drew an antelope special permit were selected from the data base. Rancher names and addresses were obtained from county extension agents. Every county extension agent in the state was sent a letter requesting the names of 25 ranchers, who controlled a minimum of 1000 acres, and who in the opinion of the county agent, had views on hunter/rancher related issues representative of the county. Twenty-three ranchers randomly selected from each list of 25 and a total of 989 surveys were sent. Forty-three of 56 counties in Montana returned complete mailing lists and were represented in the survey.

### Survey Design

The survey consisted of a cover letter, the questionnaire, and a map outlining hunting regions within the state (Appendices A and B). The cover letter explained how names for the mailing lists were obtained, who was sponsoring the project, and the purpose for conducting the survey. The Montana Fish, Wildlife and Parks regional map was included on the back of each letter for use with questions pertaining to regional data (Appendices A and B). For analysis of regional data, the state was divided into three Areas, the East Area, Central Area and West Area (Figure 1). Survey questions were asked in a closed response format, with multiple answer choices available.

### Hunter/Rancher Background

Two forms of the questionnaire were used. The first portion of one form was designed to get information unique to hunters. The first portion of the other form related to information unique to ranchers. Both forms had the same follow-up questions. Hunters were asked about the number of years they had hunted and were given response choices of 1 year, 2 to 5 years, 6 to 10 years, and more than 10 years. Hunters were asked to indicate the species of big game hunted during the 1994 season and the species of big game hunted, region and if hunting occurred on public land, private land or both for each species they hunted.

Ranchers were asked questions related to management of hunters on the land to which they controlled access. Questions referred to an attached map which was used to



Figure 1. Map of Area divisions within the state for survey analysis. West Area is 1, Central Area is 2 and East Area is 3.

identify the region(s) of the ranch location. Ranchers were asked to identify the number of acres on which they controlled hunting during the 1994 big game season and what percent of the land was deeded and whether they were the owner, manager or both owner and manager of the ranch. Ranchers were asked to identify the number of days people hunted on their land and the number of people that hunted on their land during the 1994 big game season. Ranchers were also asked if deer, elk or antelope were present in huntable numbers on the lands they managed or owned during the 1994 big game season.

Ten choices were given to ranchers as possible management strategies used for managing hunters on their property. If the land was closed to hunting, respondents were asked to identify and rank seven possible choices listed as reasons for the closure.

#### Hunter/Rancher Conflicts and Solutions

After the initial background questions, the survey questions were identical on both hunter and rancher survey forms. Both groups were asked if they felt there were conflicts between hunters and ranchers. If respondents answered "yes", they were asked to rank from 0 to 5 their opinion about 14 listed problems. Zero meant the conflict was not a problem and 5 meant it was a major problem. Both groups were then asked to respond to 10 possible solutions for hunter/rancher conflicts and rank them from 0 to 5 with 0 having low potential as a solution and 5 having high potential as a solution. If the answer was "no" to the hunter/rancher conflicts questions, respondents were instructed to go to the next section of the survey.

The groups were asked if they had a negative or positive experience with the other

group. Respondents were asked a series of questions about big game populations and if they felt deer, elk and antelope populations had increased, decreased or had remained the same over the last five years. They were asked if they felt hunting pressure and private land access had changed over the last five years. Questions were asked about the effects of private land on big game species in Montana and the effects of agricultural practices on big game habitat in Montana. Respondents were given a choice ranging from very positive to very negative.

The last question on the survey asked who the respondent felt best represented them in hunter/rancher related issues. They were given a choice of possible responses including; Montana Fish, Wildlife and Parks, several special interest groups, legislative representative, yourself, no one, or don't know.

### Survey Procedure

Prior to sending the primary survey, a pre-survey was mailed to local livestock producers, hunters, and others who were active in dealing with hunter/rancher related issues. A cover letter was enclosed to ask for assistance in identifying any misunderstandings or poorly worded questions in the survey. This was done to identify any problems with the questionnaire before the survey was mailed to the sample population.

The primary survey was sent out on August 9, 1995 and responses were received until October 12, 1995. Surveys returned after October 12th were not tabulated because of possible confusion of the opening of the 1995 hunting season would have on the survey time frame.

Possible non-respondent bias was addressed using twenty-five people, randomly

selected from both the hunter list and the rancher list, who did not respond to the survey. These people were telephoned between October 18th and 20th and asked to respond to the survey over the telephone. This information was used to test for biases by comparing the telephone responses to the mail responses. Individual responses were tabulated for each survey using a spreadsheet format, for statistical analysis.

### Statistical Analysis

Data, reported as percentages of all identical questions were analyzed using the chi-square procedures of SAS (1994). Problems and solutions were analyzed individually and compared between groups. The survey responses 0 through 5 were grouped to strengthen the low and high responses. The problems were grouped as 0 and 1 being no problem, 2 and 3 as a problem, and 4 and 5 as a major problem. The solutions were grouped as 0 and 1 having little possibility as a solution, 2 and 3 as potential solutions, and 4 and 5 as high potential solutions.

Analysis of variance was used to evaluate hunter/rancher conflicts and solutions by region using the GLM procedure of SAS (1994). Hunter, rancher, region, and all two-way interactions were fitted as main effects in the model. Problems and solutions were analyzed using the t-tests (SAS, 1994). Due to the large number of degree of freedom an alpha level of .01 was used.



## CHAPTER 4

## RESULTS

Hunter Background

Thirty-five percent of the hunters responded to the mail survey. Of those responding, 68% had more than ten years of hunting experience (Table 1). During the 1994 big game season 85% of hunters responding hunted deer, 73% hunted elk, and 79% hunted antelope. The largest percentage of hunters spent three to seven days hunting all three species during the 1994 big game season (Table 1). Hunters spent 48% of their time hunting deer on a combination of private and public lands. Elk and antelope were hunted more exclusively on public or private lands, respectively. Elk were hunted on public lands 52% of the time, with antelope being hunted on private land 49% of the time (Table 1). When experienced hunters (>10 years) were compared to novice hunters (<10 years) the only difference was that experienced hunters spent fewer days hunting all species combined.

Table 1. Hunter background information (percentage of hunters by category)

	Years Hunted				N
	1 year	2-5 years	6-10 years	>10 years	
Hunters, %	1	16	16	68	335
	Number of days hunted by species				N
	1-2 days	3-7 days	8-14 days	>15 days	
Deer	9	40	26	24	295
Elk	21	36	24	19	254
Antelope	43	51	5	2	275
	Land status hunted				N
	Private	Public	Both	Don't know	
Deer	29	21	48	2	320
Elk	14	52	33	1	272
Antelope	47	17	34	2	292

### Rancher Background

Forty-two percent of the ranchers responded to the survey. Rancher background information obtained included ranch size, ownership, species present, hunter days and number of hunters. Ranch sizes ranged from less than 404 ha to greater than 40485 ha (Table 2). Sixty-one percent of ranchers responding to the survey owned or managed property from 404 to 4048 ha. Sixty-six percent of the respondents were both owners and managers of their property (Table 2), with 72% of the ranchers having at least three-quarters of the land deeded (Table 2). Respondents reporting the percentage of big game species present in huntable numbers ranged from 93% for deer, 38% for elk, and 64% for antelope.

Ranchers were asked to estimate the number of days that people hunted on their land during the 1994 big game season (Table 2). Fifty-one percent of the responding ranchers had hunters on their property more than 21 days during the 1994 big game season. Besides the number of hunter days, ranchers were asked to estimate the number of people that had hunted on their land during the 1994 big game season (Table 2). This answer varied from 1 to more than 500, with no group standing out.

A comparison between ranches under 4048 ha and ranches over 4048 ha was made. The ranches under 4048 ha had fewer people hunting on their land but had a similar number of hunter days. Game species present on the ranches over 4048 ha were similar to ranches under 4048 ha.

Table 2. Ranch background information (percentage of ranchers by category)

		Ranch size, in hectares (N=387)							
		<404	404-2023	2024-4048	4049-20234	20235-40485	>40485		
Ranches, %		13	35	26	21	2	2		
		Ownership and management (N=383)							
		Owner	Manager	Owner/Manager	Other				
Ranches, %		28	6	66	1				
		Percent deeded lands (N=389)							
		0-25 %	26-50 %	51-75 %	76-100%				
Ranches, %		4	8	16	72				
		Hunter days (N=388)							
		0	1-5	6-10	11-15	16-20	21-50	>50	Don't know
Ranches, %		4	5	7	10	13	30	21	10
		Number of hunters on property (N=385)							
		1-10	11-20	21-30	31-40	41-50	51-100	101-500	Don't know
Ranches, %		15	21	14	7	5	13	12	13

### Rancher Management Strategies

Ranchers were asked how they managed hunting on their property. They were given a choice of eleven different management strategies. Results were grouped to include management strategies used on 50% or more of their land (Table 3). Twenty-three percent of the respondents had no restrictions to hunting, 57% required simple permission, 27% had vehicle restrictions and 32% had other restrictions including advanced reservations, check

in/out and species or sex restrictions. Twelve percent of the responses indicated land that was closed to hunting, 12 % had a fee hunting operation or had leased to outfitters and 7 % were under Montana Fish, Wildlife and Parks Block Management Program. Ranchers often indicated different combinations of management on their property. These included changing management strategies as the hunting season progressed or having several restrictions (i.e., vehicle restrictions and sex restrictions) combined on various areas of their land.

Management strategies differed between ranches under 4048 ha and ranches over 4048 ha. Sixty-three percent of the ranches under 4048 ha required simple permission to hunt, compared to 28% of the ranches over 4048 ha. A larger percentage of ranches over 4048 ha used combinations of management strategies with different types of restrictions. Sixteen percent of ranches under 4048 ha had 50% or more of their lands closed to hunting, compared to 5% of the ranches over 4048 ha.

Table 3. Rancher respondents to hunting management strategies (N=395).

Management Strategies	Percent of Land <sup>a</sup>	
	< 50%	> 50%
No restrictions, totally open to hunting	4	23
Simple permission required to hunt	8	57
Land closed to hunting	13	12
Advanced reservations required to hunt	3	12
Check in/out	0	11
Game species or sex restrictions	3	11
Vehicle restrictions	3	27
Block Management Program	1	7
Leased by outfitter	1	7
Fee hunting operation	2	5

<sup>a</sup> Totals exceed 100% because respondents selected more than one strategy for management

If a rancher indicated that their land was closed to hunting they were asked to rank 7 possible reasons for closure giving the reasons an importance rating from 1 to 3, with 1 being the most important reason for land closure. Ranchers who had more than 50% of their land closed to hunting (12% of the respondents) indicated that lands were closed due to past damage by hunters (42%) and conflicts with hunters (33%) (Figure 2). Those ranches with less than 50 % of land closed often reported the reason as no hunting allowed around buildings or livestock (36%). Size of the ranch did not seem to be related with specific conflicts leading to lands being closed.

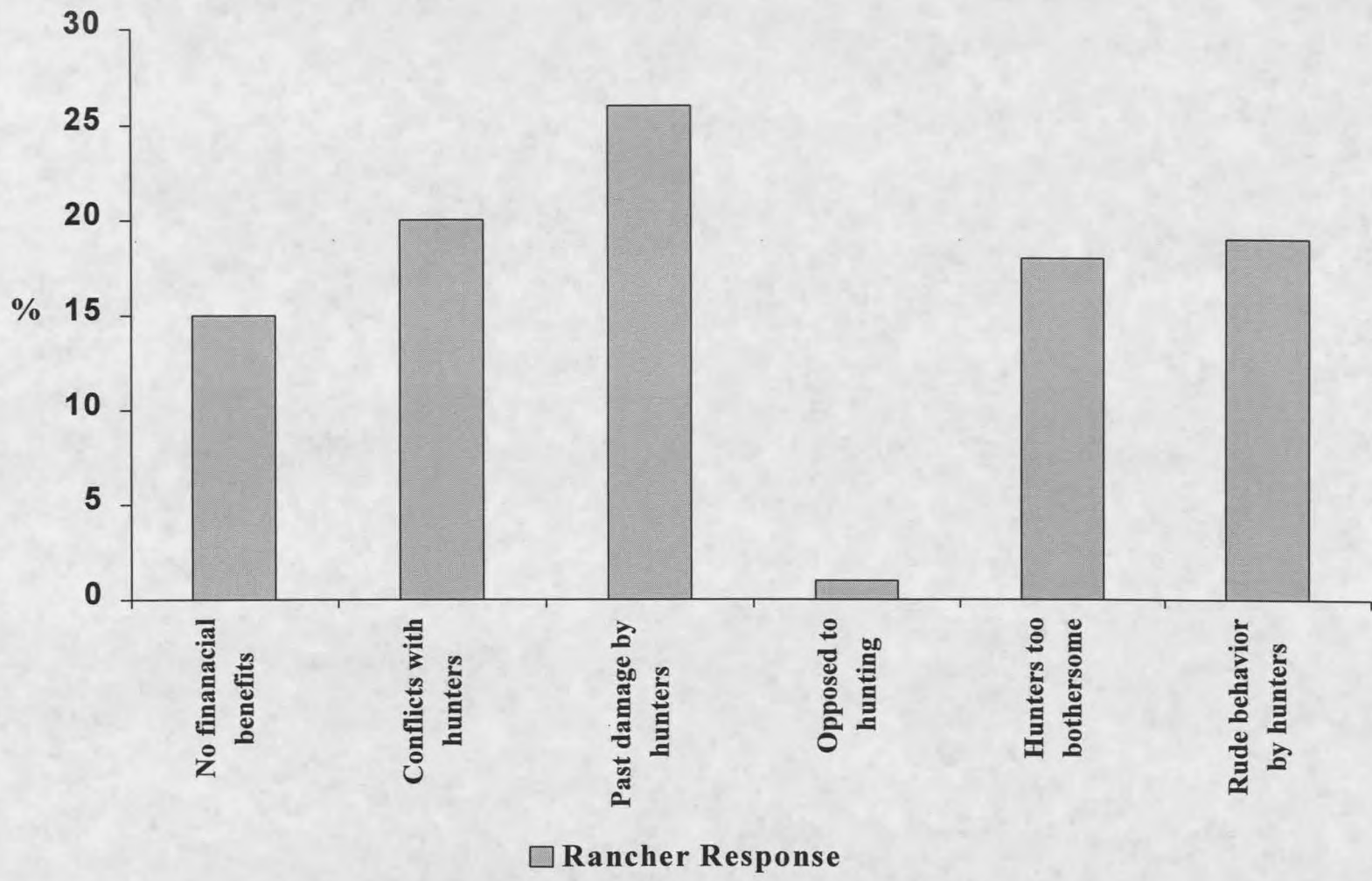


Figure 2. Reasons for land closure by ranchers (first and second ranked choice only)

### Hunter/Rancher Conflicts

Hunters and ranchers were asked to identify perceived conflicts between the two groups and were given 14 choices. Data were combined to strengthen the response for statistical analyses. Conflicts that scored as a major problem (responses 4 and 5) were ranked for both hunters and ranchers (Table 4).

Table 4. Ranking of conflicts (1-14) that hunters (N=349) and ranchers (N=395) classify as a major problem.

Conflict	Hunter Rank	Rancher Rank
Damage to property by hunters	8	4
Litter from hunting	6	6
Too many hunters	5	3
Damage to roads	13	8
Driving off roads	2	1
Too little access	1	12
Lack of proper maps	7	9
Damage to livestock	14	10
Unclear property postings	4	11
Trespassing	3	2
Negative public statements by hunters	11	5
Negative public statements by ranchers	9	13
Abuse of land by hunters	10	7
Abuse of land by ranchers	12	14



The top three conflicts ranked as a major problem by hunters were: too little access to private land, driving off roads, and trespassing (Figure 3, 4 and 5). The top three conflicts ranked by ranchers as a major problem were; driving off roads, trespassing and too many hunters (Figure 4, 5 and 6).

Ranchers ranked driving off roads and trespassing as ( $P < .01$ ) greater problems than hunters (Appendix C, Table 10). Too little access to private land was ranked as more ( $P < .01$ ) of a problem by hunters than ranchers. Too many hunters was ranked similar ( $P > .1$ ) as a major problem by both hunters and ranchers.

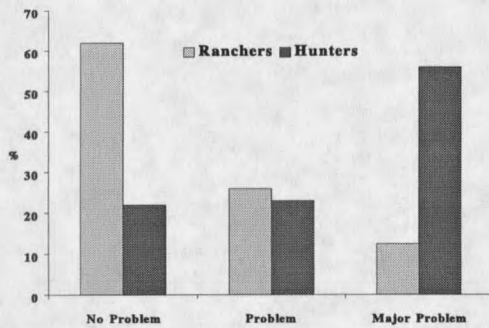


Figure 3. Hunter/rancher response to too little access

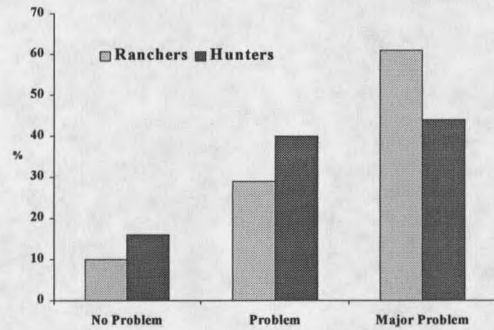


Figure 4. Hunter/rancher response to driving off roads

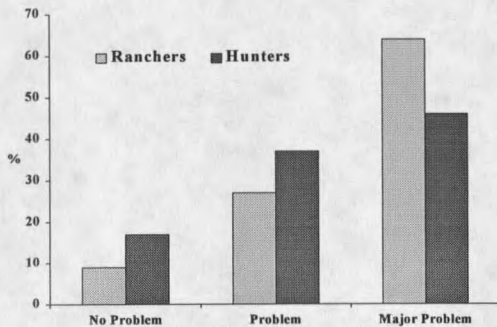


Figure 5. Hunter/rancher response to trespassing

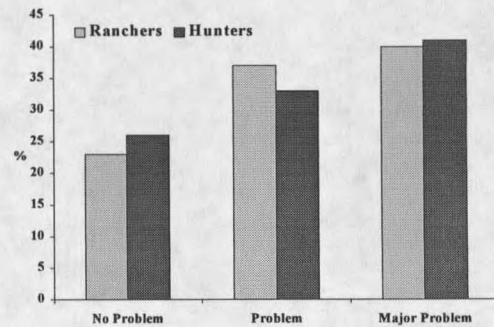


Figure 6. Hunter/rancher response to too many hunters

Identifying perceived conflicts which hunters and ranchers rated as no problem is as important as conflicts which are identified as major problems. Three choices that hunters perceived as no problem include; damage to livestock, abuse of land by ranchers, and damage to roads. Ranchers identified choices that they perceived as no problem as abuse of land by ranchers, too little access, and unclear property postings. Hunters and ranchers both agreed that abuse of land by ranchers is not a problem but ranchers ranked it lower ( $P < .01$ ) than hunters. Too little access was considered a major problem by hunters but not a problem by ranchers. Other choices, which were ranked as no problem and were different ( $P < .01$ ) between hunters and ranchers include; lack of proper maps and negative public statements by ranchers. Negative public statements by hunters were not different ( $P > .1$ ) between hunters and ranchers.

Problems were compared between experienced ( $>10$  years) and novice ( $<10$  years) hunters. Hunting experience had no effect on responses to the 14 problems when compared to the group as a whole or between years.

Problems were also compared to ranch size. Ranches over 4048 ha had a higher percentage report of damages to roads and driving off roads as major problems compared to ranches under 4048 ha.

### Hunter/Rancher Solutions

Hunters and ranchers were asked to respond to ten choices of possible solutions to hunter/rancher conflicts. Data were combined to increase the response for statistical

analysis. Solutions identified as having a high potential (responses of 4 and 5) are ranked for both hunters and ranchers in Table 5.

Hunters ranked greater consideration and appreciation by ranchers, better communication between hunters and ranchers and better boundary identification as having the highest potential as solutions (Figure 7, 8 and 9) to hunter/rancher conflicts. The top three solutions to hunter/rancher conflicts as identified by ranchers were; stiffer penalties for violators, better communication between hunters and ranchers and greater consideration and appreciation by hunters (Figure 7, 8 and 10).

Hunters ranked greater consideration and appreciation by ranchers as having higher ( $P < .01$ ) potential for a solution than ranchers (Appendix C, Table 11). Stiffer penalties for violators was ranked as having higher ( $P < .01$ ) potential as a solution by ranchers than by hunters. Hunters and ranchers agreed ( $P > .1$ ) that better communication between the two groups has high potential as a possible solution to hunter/rancher conflicts.

Solutions were compared between experienced and novice hunters. Fifty-six percent of experienced hunters reported better communication had high potential as a solution whereas, only 45% of the novice hunters reported this solution as having high potential. Ranch size was used as a comparison for solutions and no differences were found due to ranch size.

Table 5. Ranking of solutions (1-10) that hunters (N=349) and ranchers (N=395) classified as having high potential.

Solutions	Hunter Rank	Rancher Rank
Better communication between the two groups	3	2
Stiffer penalties for violators	5	1
More involvement by state and federal agencies	9	9
Less involvement by state and federal agencies	6	5
Shorter hunting seasons	10	6
Longer hunting seasons	7	10
Better boundary identification of public and private lands	4	7
More game wardens	8	8
Greater consideration for the concerns of the other group	1	4
Greater appreciation for the contributions of the other group	2	3

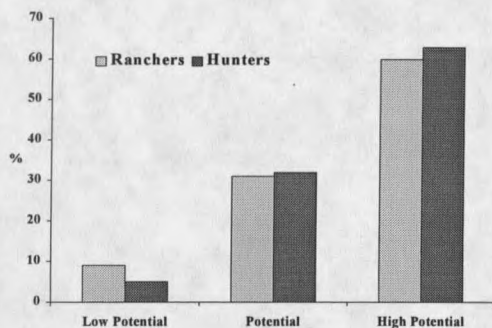


Figure 7. Hunter/rancher response to greater consideration and appreciation

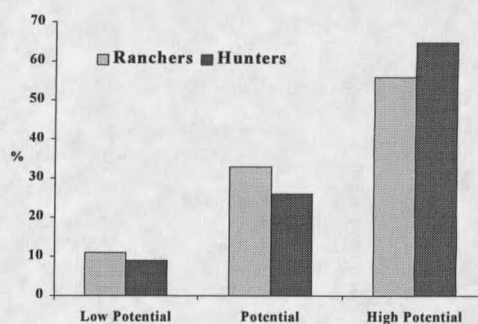


Figure 8. Hunter/rancher response to better communication

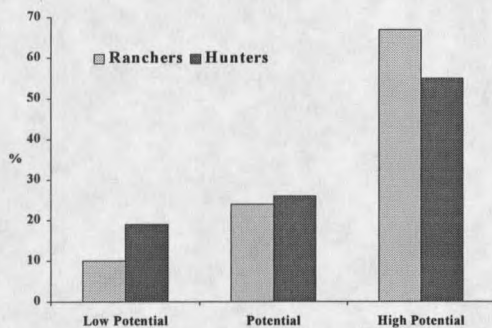


Figure 9. Hunter/rancher response to better boundary identification

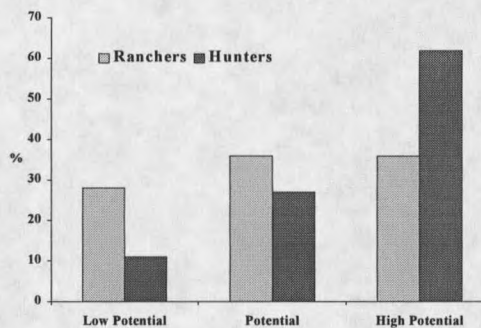


Figure 10. Hunter/rancher response to stiffer penalties for violators

It is important to identify possible solutions which hunters and ranchers feel have no potential to resolve conflicts. Choices that hunters rank as having no potential as a solution include; shorter hunting seasons, longer hunting seasons and more involvement by state and federal agencies. Choices that ranchers feel have no potential as possible solutions to conflicts are; longer hunting seasons, more involvement by state and federal agencies and shorter hunting seasons. More game wardens, and less involvement by state and federal

agencies also were ranked by hunters and ranchers ( $P>.03$ ) as having low potential as a possible solution.

### Positive and Negative Experiences

Hunters and ranchers were asked if they had a positive or negative experience with the other group. Forty-three percent of ranchers replied they had a negative experience with hunters and 70 % claimed they had a positive experience with hunters during the 1994 big game season. During the 1994 big game season 19% of hunters had a negative experience with a rancher, compared with 78% that had a positive experience with a rancher. A larger ( $P<.01$ ) percentage of ranchers reported having negative experiences with hunters than hunters had with ranchers during the 1994 big game season (Appendix C, Table 12).

When experienced hunters (>10 years) were compared to novice hunter (<10 years) 23% of the experienced hunters claimed a negative experience compared to 15% of novice hunters. There was no difference between positive experiences. Ranch size also has an effect on negative experiences with hunters. Larger ranches (>4048 ha) had more (56%) negative experiences than small ranches (4048 ha) (40%). Positive experiences were similar for all size ranches.

### Big Game Populations

Hunters and ranchers were asked to indicate their perception of the status of deer, elk and antelope populations in the last five years in Montana (Table 6). Most hunters responding believed that deer and elk numbers have increased. Responses to antelope population status were split between having increased and decreased during the last five

years. Most ranchers reported deer, elk and antelope populations have increased in the last five years.

Table 6. Hunter (N=349) and rancher (N=395) opinions of deer, elk, and antelope populations in the last five years.

	Hunters, %				Ranchers, %			
	Increased	Decreased	Same	Don't Know	Increased	Decreased	Same	Don't Know
Deer	55	13	25	6	66	11	18	3
Elk	49	11	20	17	57	3	5	18
Antelope	35	30	23	12	39	13	21	18

### Hunting and Agriculture in Montana

Hunters and ranchers were asked questions on hunting pressure and hunting access changes in the last five years and the effects of private lands and agriculture on big game species in Montana. Eighty-two percent of hunters and 66% of ranchers reported hunting pressure has increased in the last five years (Table 7).

Level of hunting experience influenced responses to questions on hunting pressure and access. Eighty-eight percent of experienced hunters (>10 years) responded that hunting pressure had increased and 79% reported access to private lands had decreased. Seventy-percent of the novice hunters (<10 years) responded that hunting pressure has increased and 74% reported decreased access. Ranch size did not affect rancher response to questions concerning hunting pressure and private land access.

Table 7. Hunter (N=349) and rancher (N=395) response to hunting pressure and private land access in Montana in the last five years.

	Hunters, %				Ranchers, %			
	Increased	Decreased	Same	Don't Know	Increased	Decreased	Same	Don't Know
Hunting Pressure	82	0	11	5	66	3	22	6
Private Land Access	6	77	9	8	7	65	15	10

Hunters and ranchers were asked to rate the effect private lands and agriculture have on wildlife species and wildlife habitat. Choices were very positive, positive, no effect, negative and very negative (Table 8). Seventy-three percent of the hunters and 92% of the ranchers rated private lands and agriculture as having a positive to very positive effect on wildlife and its habitat.

### Representation

The last question on the survey asked hunters and ranchers to identify who represented them on hunter/rancher related issues. Forty-seven percent of hunters believed they represented themselves or have no representation in hunter/rancher related issues (Table 9). Ranchers responded that 57% were represented by a producer group of some kind on these issues (Table 9). As expected, hunter and rancher views on representation were different ( $P < .01$ ) on hunter/rancher related issues (Appendix C, Table 12).



### Statewide Differences

Topographically Montana has three distinct Areas. Figure 2 indicates the division of the state into 3 Areas; West, Central and East. Hunter and rancher responses to conflicts and solutions were analyzed by Area to look for differences across the state.

Experiences between hunters and ranchers, both negative and positive, were not different ( $P > .1$ ) among the three Areas of the state (Appendix D, Table 15). Hunter and rancher opinions did differ slightly by Area on the status of big game populations. Antelope were perceived differently ( $P < .01$ ) between the three Areas of the state. Other responses to questions on the survey were not different ( $P > .01$ ) between the three Areas of the state (Appendix D, Table 13,14).

### Non-Respondent Results

Telephone responses were compared to the mail responses to determine non-respondent biases. Answers to all questions were not significantly different ( $P > .01$ ) between the telephone and mail responses (Appendix C, Table 12). It is assumed there was no non-respondent bias in the survey.

Table 8. Hunter (N=349) and rancher (N=395) responses relative to the effects of land ownership on wildlife in Montana.

	% Hunters					% Ranchers				
	Very Positive	Positive	No Effect	Negative	Very Negative	Very Positive	Positive	No Effect	Negative	Very Negative
Private Land	30	41	13	11	3	63	25	7	1	1
Agriculture	27	46	14	10	3	47	42	3	4	1

Table 9. Hunters (N=349) and rancher (N=395) representation on hunter/rancher related issues

	Fish, Wildlife and Parks	Interest Groups <sup>a</sup>	Legislative Representative	Yourself	No One	Don't Know
% Hunters	30	23	1	37	4	9
% Ranchers	7	62	4	27	4	9

<sup>a</sup> Hunters choices included; Montana Wildlife Federation and local sportsmen groups.

Ranchers choices included; Montana Stockgrowers Assoc., Farm Bureau, and Montana Wool Growers.

## CHAPTER 5

## DISCUSSION

Background

Identifying hunter and rancher background information is important to help describe the characteristics of the survey respondents. Background information on this survey was limited to a few questions because of the length of the problems and solutions portion of the survey, but it did allow for some descriptive information to be obtained.

Hunter Background

The stake holders for hunters are those who hunt several species of big game during the season, and are avid hunters. The survey had a bias towards avid hunters due to the process that was used to select from hunter mailing lists. By selecting hunters who had purchased a combination sportsman license and had drawn an antelope permit for the 1994 big game season it is most likely there were more avid hunters in the survey population than in the general population. This is demonstrated by 68% the responding hunters having greater than ten years of hunting experience. It can also be seen in the high percentage of responding hunters hunting deer (85%), elk (79%) and antelope (73%), during the 1994 big game season. The opinions of avid hunters may be stronger because they have more experience and spend more time hunting during the season. The difference between days

hunted by experienced hunters and novice hunters could be due to a higher success rate of the experienced hunters. However there were no questions on the survey pertaining to hunting success.

It is important to find out if hunters are hunting on private or public land to identify the possibility of hunter/rancher conflicts. Deer, elk and antelope were all hunted to some extent, on private lands, with the highest percentage of hunting on private land for antelope (47%). Swenson (1983) stated that if hunting recreation is not encouraged on private lands, pressure on public lands will become so great, hunting would have to be restricted severely. Private lands in Montana accounted for over 30% of the responding hunters activities. If the response choice of "both" and "private" are combined hunters spent over 68% of their time hunting on private lands. This indicates a substantial use of private land in Montana for big game hunting.

### Rancher Background

The stake holders for ranchers in this survey are those who control more than 404 ha of land and have big game in huntable numbers on their property. The average agricultural property holding in Montana is 1000 ha (Montana Agric. Stat. Serv. 1994). Eighty-seven percent of the responding ranchers owned or managed more than 404 ha of land. Of ranchers responding to the survey, 61% owned or managed 404 to 4084 ha, which includes the 1000 ha Montana average. A large percentage (72%) of the ranchers had greater than 75% of their land deeded and 66% of ranchers were both owners and managers of those lands.

The presence of big game species in huntable numbers on private land indicates the

importance of private land to wildlife and hunting opportunities. Ranchers responding to the survey indicated deer (93%), elk (38%) and antelope (64%) were plentiful on their lands. The high percentage of responses reflects the wide distribution of white-tail and mule deer, over the entire state. Elk and antelope have more specific ranges, with the majority of the elk in the Western and Central Areas of the state and the majority of the antelope in the Eastern and Central areas of the state. Fifty-seven percent of the responding ranches in the West and Central Areas indicated their ranch contained elk, compared to 7% of the responding ranches in the East Area. The responding ranchers from the Central and Eastern areas indicated that 78% of their ranches contained antelope, compared to 31% of the Western Area ranches.

The difference between ranch size and number of hunters is most likely due to the fact that larger ranchers can allow more hunters at one time than the smaller ranches. Both small and large ranchers had hunters on their property about the same number of days.

#### Rancher Management Strategies

Throughout the United States hunter access to private lands is decreasing at an alarming rate (Wright and Kaiser, 1986; Cook and Cable, 1992). In contrast to this, a survey of agricultural producers throughout the United States (Conover, 1994) found that 79% allowed hunting, although the number of people allowed to hunt was restricted. Eighty percent of Montana ranchers responding to our survey allowed hunting with no restrictions or simple permission on more than 50% of their land. Large ranches used a wider variety of management strategies. Twelve percent of the ranchers had more than 50% of their lands

closed to hunting. The larger percentage of ranches closed to hunting were the ranches under 4048 ha. This could be caused by more noticeable damage, and smaller ranches are easier to close and enforce than large ranches. Forty-two percent of the lands closed were due to past damage by hunters and 33% were because of conflicts with hunters. Landowners are often reluctant to permit access because of vandalism and rude behavior by hunters (Brown et al., 1984; Guynn and Schmidt, 1984; and Adkins, 1991).

### Hunter/Rancher Conflicts

Hunters and ranchers indicating there were conflicts between the groups ranked driving off roads and trespassing as major problems. In a survey of wildlife administrators' throughout the United States, Wright and Kaiser (1986) found that trespassing and property damage were major problems landowners faced. Hunters and ranchers responding to our survey felt that abuse of land by ranchers is not a problem in Montana. It is important to identify issues that both groups feel are no problems, especially when looking to identify common ground issues between the groups. Issues that could be important for wildlife manager focus are those that hunters and ranchers feel very differently about. This includes; damage to property by hunters, damage to roads, too little access, unclear property postings and negative public statements. Conflict issues which both hunters and ranchers identify can be resolved through improved communication in many instances. Conflict issues identified by only one group will take more involvement by both groups to resolve.

Conflicts that were different between the large ranches (>4048 ha) and small ranches (<4048 ha) were damage to roads and driving off roads. The large ranches indicated that this

is more of a problem due to the fact they control and have more roads and area available for driving.

### Hunter/Rancher Solutions

The identification of conflicts may be important, but often hunter and rancher opinions on solutions to conflicts are disregarded. It is important to realize that people involved in conflicts have possibly thought of ways to resolve the problem. Literature rarely focuses on positive aspects of hunter/rancher relations. Elliot (1992) proposed that hunters and landowners can work out conflicts through better communication and education. Knight et al. (1987) reported that most hunters and ranchers had a sincere desire to improve relationships.

Responding hunters and ranchers ranked; better communication between groups and greater consideration and appreciation of the other group as two of their top three solutions. Both of these potential solutions require more communication and education for both groups. Solutions which hunters and ranchers recognized as having little potential to resolve conflicts include; shorter hunting seasons, longer hunting seasons, and more involvement by state and federal agencies. Both hunters and ranchers indicated that changes in present management of hunting seasons is not a positive solution to resolving conflicts.

### Big Game Populations

Wildlife populations have increased over the last 30 years in the United States (Conover and Decker, 1991). Hunters and ranchers responded differently to the status of big game populations in Montana. Both hunters and ranchers respond that deer and elk

populations have increased in the last five years. Ranchers reported that antelope populations have increased, however, hunters responded differently; 35% felt antelope populations had increased, and 30% felt antelope numbers had decreased. Recently several popular outdoor magazines have contained information about the possible decline of antelope populations in the west (Montana Outdoors 1995 and Outdoor Life 1995). Hunters responding to the survey might have been influenced by these articles, or their own perceptions from previous hunting seasons.

#### Hunting and Agriculture in Montana

Hunters (82%) and ranchers (66%) both agree that hunting pressure has increased in the last five years. The popularity of hunting continues to grow, especially in the Western United States. As hunting pressure increases, there is an increased demand for access for hunters. Both hunters (77%) and ranchers (65%) report that access to private land for hunting has decreased in the last five years. Cook and Cable (1992) claimed that decreases in the public's participation in hunting could be blamed on decreased access to land.

Private land provides important habitat for wildlife species throughout Montana. Hunters and ranchers agree that private land has a positive effect on wildlife in Montana. Most large blocks of private land that provide habitat for big game are also under some kind of agricultural management. Both hunters and ranchers responded that agriculture in Montana has a positive effect on wildlife. It is important to recognize that both groups appreciate private property and agriculture and its effects on wildlife and wildlife habitat. This identifies an important common ground issue between the two groups.



## Representation

In order to promote positive ideas and educate hunters and ranchers, ideas must be easily disseminated to the population. Forty seven percent of the hunters responding to the survey believe they represent themselves or have no representation on hunter/rancher related issues. In contrast to this, 57% of the ranchers believe they are represented by a producer group (i.e., Montana Stockgrowers Association, Farm Bureau or Montana Wool Growers) on hunter/rancher related issues. This gives ranchers an advantage on being more educated on issues and events which could affect both groups. Beucler et al. (1994) found a major concern of Idaho hunter groups was organization and public relations. Hunter groups need to build stronger ties with both the hunting and ranching communities if conflicts are going to be alleviated in the future. There is a need for hunters to have a group to represent them in hunter/rancher related issues. Twenty-three percent of the hunters responded that an interest group represented them in hunter/rancher related issues. This was more evident on a local basis since only 3% were represented by the Montana Wildlife federation compared to 20% being represented by a local sportsman group (Figure 11). Ranchers producer group representation included 51% represented by the Montana Stockgrowers Association, 7% represented by the Farm Bureau and 4% represented by the Montana Woolgrowers (Figure 11). With over half of the responding ranchers being represented by a statewide organization, it is important for hunters to develop an organization to improve the communication between the two groups.

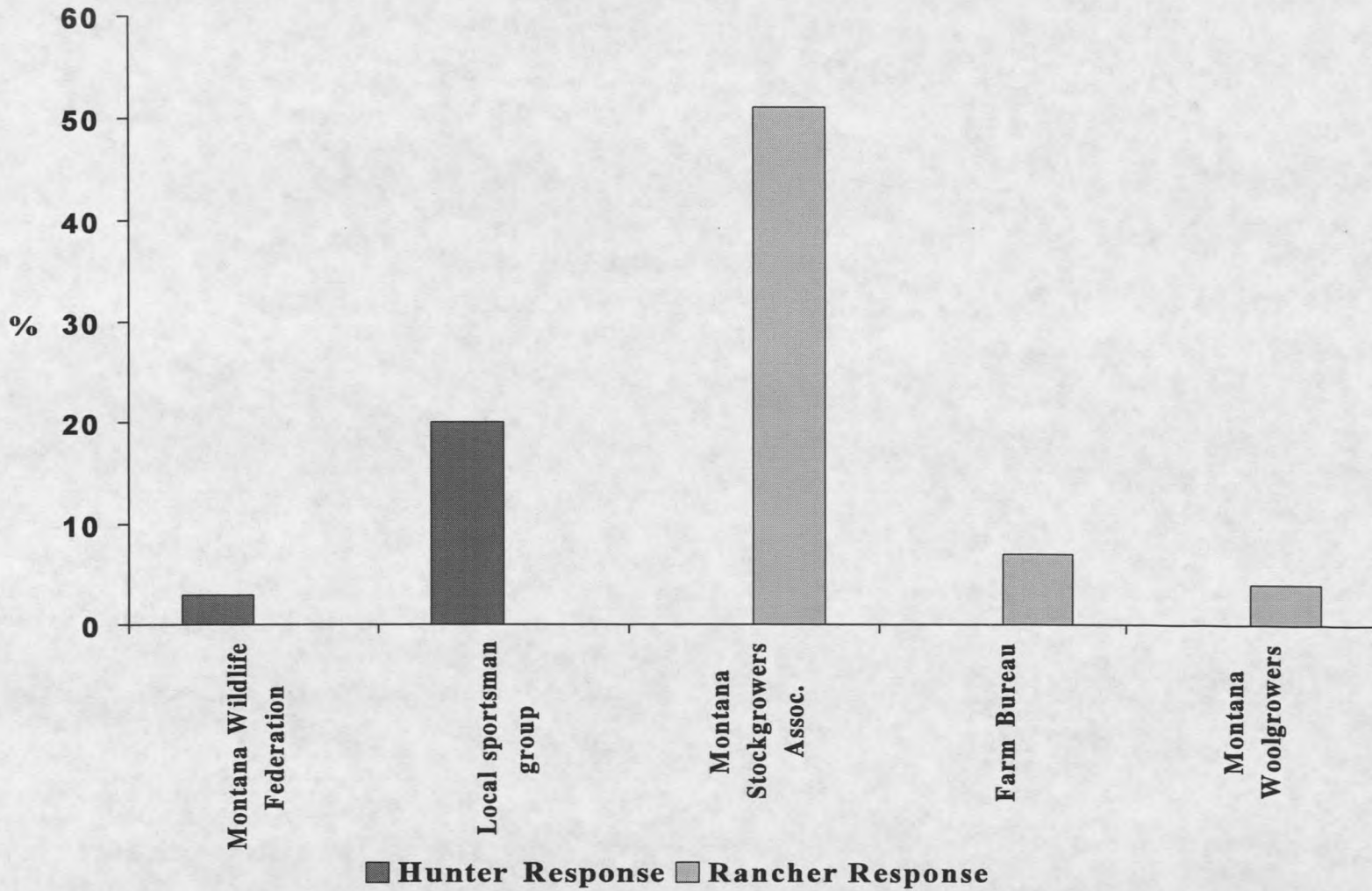


Figure 11. Distribution of interest group representation by hunters and ranchers.

## CHAPTER 6

## CONCLUSIONS

In addition to providing wildlife managers with information that should assist them in dealing with conflicts between hunters and ranchers, the results of this study are also important for livestock producer groups, and sportsmans organizations. This study points out some important information about Montana hunters and ranchers. Results indicate that hunter and rancher opinions in areas of possible conflict and solutions are similar. This information could be used by wildlife managers to establish common ground issues between the groups and help promote the idea of hunters and ranchers working together on wildlife issues. Results of this survey also indicate that both hunters and ranchers realize the important role private lands and agriculture have on wildlife in Montana. Wildlife managers could use these concepts to show the appreciation hunters have for ranchers which in turn many help to alleviate some of the access problems due to land closures. Finally, representation is a vital link to establishing better communication between Montana hunters and ranchers. If a large percentage of both groups were represented by an interest group the lines of communication would be more effective and wildlife managers could address problems and implement solutions quicker and more efficiently.

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## LITERATURE CITED

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APPENDICES

APPENDIX A  
HUNTER SURVEY

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**Extension Wildlife Specialist**

Montana State University  
Room 235, Linfield Hall  
Bozeman, MT 59717  
(406) 994-5579

July 29, 1995

Dear Montana Big Game Hunter,

You have been selected as part of a random sample of Montana hunters. Your name was drawn from a list of 1994 resident elk, deer or antelope hunters. Versions of this questionnaire are being sent to hunters and ranchers throughout Montana in an attempt to better understand hunter/rancher relationships. Through your response we will determine the extent of hunter/rancher conflicts and identify some possible solutions to these problems.

This is a cooperative project between Montana State University and the Montana Department of Fish, Wildlife and Parks. As Extension Wildlife Specialist at Montana State University, I feel addressing problems and capitalizing on opportunities will benefit both hunters and ranchers. The first step in doing this is to identify the problems, solutions and opportunities. Positive hunter/rancher relationships are necessary to properly manage natural resources in Montana.

Please complete the enclosed questionnaire in as much detail as possible. The first step in the project is to get both viewpoints so that all aspects of this situation can be considered. Your answers will only be reported as a group average and your individual responses will remain anonymous except to me.

Please return the questionnaire as soon as possible in the enclosed, postage paid envelope. Thank you for your help.

Sincerely,

James E. Knight, Ph.D.  
Extension Wildlife Specialist



**Hunter Survey**

1. How many years have you hunted big game in the state of Montana?  
 \_\_\_ 1 year \_\_\_ 2-5 years \_\_\_ 6-10 years \_\_\_ >10 years

2. For each species below indicate the number of days spent hunting in 1994 for that game animal, the region most often hunted (using the attached map), and the ownership status of the land.

<i>Species Hunted</i>	<i>Days Hunted</i>	<i>Region Hunted</i>	<i>Status of Land</i>			
Deer	_____	_____	___ Private	___ Public	___ Both	___ Don't Know
Elk	_____	_____	___ Private	___ Public	___ Both	___ Don't Know
Antelope	_____	_____	___ Private	___ Public	___ Both	___ Don't Know

3. Do you feel there are conflicts between hunters and ranchers in Montana?  
 \_\_\_yes \_\_\_no (If no, proceed to question 4)

3a. If yes, please rate the following problems from 0 to 5 with 0 being no problem and 5 being a major problem.

<i>Problem</i>	<i>Ranking</i>					
	no problem			major problem		
	0	1	2	3	4	5
damage to property by hunters	___0	___1	___2	___3	___4	___5
litter from hunters	___0	___1	___2	___3	___4	___5
too many hunters	___0	___1	___2	___3	___4	___5
damage to roads	___0	___1	___2	___3	___4	___5
driving off roads	___0	___1	___2	___3	___4	___5
too little access	___0	___1	___2	___3	___4	___5
lack of proper maps	___0	___1	___2	___3	___4	___5
damage to livestock	___0	___1	___2	___3	___4	___5
unclear property postings	___0	___1	___2	___3	___4	___5
trespassing	___0	___1	___2	___3	___4	___5
negative public statements by hunters	___0	___1	___2	___3	___4	___5
negative public statements by ranchers	___0	___1	___2	___3	___4	___5
abuse of land by hunters	___0	___1	___2	___3	___4	___5
abuse of land by ranchers	___0	___1	___2	___3	___4	___5
other ( please specify)_____	___0	___1	___2	___3	___4	___5

3b. Please rate the following solutions to hunter/rancher conflicts from 0 to 5 with 0 having low potential as a solution and 5 having high potential as a solution.

<i>Solution</i>	<i>Ranking</i>					
	low potential			high potential		
	0	1	2	3	4	5
better communication between the two groups	___0	___1	___2	___3	___4	___5
stiffer penalties for violators	___0	___1	___2	___3	___4	___5
more involvement by state and federal agencies	___0	___1	___2	___3	___4	___5
less involvement by state and federal agencies	___0	___1	___2	___3	___4	___5
shorter hunting seasons	___0	___1	___2	___3	___4	___5
longer hunting seasons	___0	___1	___2	___3	___4	___5
better boundary identification of public and private lands	___0	___1	___2	___3	___4	___5
more game wardens	___0	___1	___2	___3	___4	___5
greater consideration for the concerns of the other group	___0	___1	___2	___3	___4	___5
greater appreciation for the contributions of the other group	___0	___1	___2	___3	___4	___5
other (please specify)_____	___0	___1	___2	___3	___4	___5

4. During the 1994 big game season did you have a **negative** experience with a Montana rancher?  
 \_\_\_yes \_\_\_no

5. During the 1994 big game season did you have a **positive** experience with a Montana rancher?  
 \_\_\_yes \_\_\_no

6. In your opinion, in the last five years have these big game populations in Montana...
- |                 |                                     |                                     |  |                                     |
|-----------------|-------------------------------------|-------------------------------------|--|-------------------------------------|
| <b>deer</b>     | <input type="checkbox"/> increased, | <input type="checkbox"/> decreased, | <input type="checkbox"/> remained the same | <input type="checkbox"/> don't know |
| <b>elk</b>      | <input type="checkbox"/> increased, | <input type="checkbox"/> decreased, | <input type="checkbox"/> remained the same | <input type="checkbox"/> don't know |
| <b>antelope</b> | <input type="checkbox"/> increased, | <input type="checkbox"/> decreased, | <input type="checkbox"/> remained the same | <input type="checkbox"/> don't know |
7. In your opinion, in the last five years has big game hunting pressure in Montana...
- increased,  decreased,  remained the same  don't know
8. In your opinion, in the last five years has private land access in Montana...
- increased,  decreased,  remained the same  don't know
9. How do you feel private lands affect big game species in Montana?
- very positive affect  positive affect  negative affect  very negative affect  don't know
10. How do you feel agriculture practices affect big game habitat?
- very positive affect  positive affect  negative affect  very negative affect  don't know
11. Who do you feel best represents you in statewide hunter/rancher related issues? (Choose one)
- Montana Fish, Wildlife, and Parks
- Montana Wildlife Federation
- Local Sportsman Group
- Legislative Representative
- Yourself
- No One
- Don't Know
- other (please specify) \_\_\_\_\_

Please write any additional comments you have which relate to hunter/rancher relationships.

APPENDIX B  
RANCHER SURVEY

---

**Extension Wildlife Specialist**

Montana State University  
Room 235, Linfield Hall  
Bozeman, MT 59717  
(406) 994-5579

July 29, 1995

Dear Montana Rancher,

You have been selected as part of a random sample of Montana ranchers. County Extension agents were asked to identify ranchers from their area that would have viewpoints typical of many Montana ranchers. Versions of this questionnaire are being sent to hunters and ranchers throughout Montana in an attempt to better understand hunter/rancher relationships. Through your response we will determine the extent of hunter/rancher conflicts and identify some possible solutions to these problems.

This is a cooperative project between Montana State University and the Montana Department of Fish, Wildlife and Parks. As Extension Wildlife Specialist at Montana State University, I feel addressing problems and capitalizing on opportunities will benefit both hunters and ranchers. The first step in doing this is to identify the problems, solutions and opportunities. Positive hunter/rancher relationships are necessary to properly manage natural resources in Montana.

Please complete the enclosed questionnaire in as much detail as possible. The first step in the project is to get both viewpoints so that all aspects of this situation can be considered. Your answers will only be reported as a group average and your individual responses will remain anonymous except to me.

Please return the questionnaire as soon as possible in the enclosed, postage paid envelope. Thank you for your help.

Sincerely,

James E. Knight, Ph.D.  
Extension Wildlife Specialist





## Rancher Survey

1. Using the attached regional map as a guide, in which region(s) is your ranch located?  
 1     2     3     4     5     6     7     8

2. How many acres of land did you control hunting on during the 1994 big game season?  
 less than 1,000     1,000 to 5,000     5,001 to 10,000     10,001 to 50,000  
 50,001 to 100,000     greater than 100,000

3. What percent of the land is deeded?  
 0-25%     26-50%     51-75%     76-100%

4. Please indicate if you are the owner or manager of the ranch.  
 Owner     Manager     Both owner and manager

5. Please mark each type of hunter management strategy used on your lands during the 1994 big game season and give an approximate percent of your land managed with that strategy.

<i>Management Strategy</i>	<i>Percent</i>
<input type="checkbox"/> no restrictions, totally open to hunting	_____ %
<input type="checkbox"/> simple permission required to hunt	_____ %
<input type="checkbox"/> land closed to hunting	_____ %
<input type="checkbox"/> advanced reservations required to hunt	_____ %
<input type="checkbox"/> check in/out	_____ %
<input type="checkbox"/> game species or sex restrictions	_____ %
<input type="checkbox"/> vehicle restrictions (ie: walk-in only)	_____ %
<input type="checkbox"/> Block Management Program	_____ %
<input type="checkbox"/> leased by outfitter	_____ %
<input type="checkbox"/> fee hunting operation	_____ %
<input type="checkbox"/> other (please specify) _____	_____ %

6. If any lands are closed to public hunting please rank from 1 to 3, with the most important reason being 1, as to why you choose to close hunting.

lack of financial benefits  
 conflicts with hunters  
 past damage by hunters  
 opposed to all hunting  
 hunters too bothersome  
 rude behavior by hunters  
 other (please specify) \_\_\_\_\_

7. Approximately how many days did you have hunters on your land during the 1994 big game season?  
 0 days     1-5 days     6-10 days     11-15 days     16-20 days     21-50 days  
 > 50 days     Don't Know

8. Approximately how many people hunted big game on land(s) you managed during the 1994 big game general hunting season?  
 1-10     11-20     21-30     31-40     41-50     51-100  
 101-500     > 500     Don't Know

9. Which of the following game animals were present in huntable numbers on the lands you managed during the 1994 general hunting season? (check all that apply)

deer  
 elk  
 antelope

10. Do you feel there are conflicts between hunters and ranchers in Montana?  
 yes  no (if no, proceed to question 11)

10a. If yes, please rate the following problems from 0 to 5 with 0 being no problem and 5 being a major problem.

<i>Problem</i>	<i>Ranking</i>				
	no problem		major problem		
damage to property by hunters	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
litter from hunting	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
too many hunters	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
damage to roads	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
driving off roads	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
too little access	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
lack of proper maps	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
damage to livestock	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
unclear property postings	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
trespassing	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
negative public statements by hunters	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
negative public statements by ranchers	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
abuse of land by hunters	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
abuse of land by ranchers	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
other ( please specify) _____	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5

10b. Please rate the following solutions to hunter/rancher conflicts from 0 to 5 with 0 having low potential as a solution and 5 having high potential as a solution.

<i>Solution</i>	<i>Ranking</i>				
	low potential		high potential		
better communication between the two groups	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
stiffer penalties for violators	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
more involvement by state and federal agencies	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
less involvement by state and federal agencies	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
shorter hunting seasons	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
longer hunting seasons	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
better boundary identification of public and private lands	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
more game wardens	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
greater consideration for the concerns of the other group	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
greater appreciation for the contributions of the other group	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5
other ( please specify) _____	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4 <input type="checkbox"/> 5

11. During the 1994 big game season did you have a **negative** experience with a Montana hunter?  
 yes  no

12. During the 1994 big game season did you have a **positive** experience with a Montana hunter?  
 yes  no

13. In your opinion, in the last five years have big game populations in Montana...  
**deer**  increased,  decreased,  remained the same  don't know  
**elk**  increased,  decreased,  remained the same  don't know  
**antelope**  increased,  decreased,  remained the same  don't know

14. In your opinion, in the last five years has big game hunting pressure in Montana...  
 increased,  decreased,  remained the same  don't know

15. In your opinion, in the last five years has private land access in Montana...  
 increased,  decreased,  remained the same  don't know

16. How do you feel private lands affect big game species in Montana?  
 very positive affect  positive affect  negative affect  very negative effect  don't know

17. How do you feel agriculture practices affect big game habitat?  
 very positive affect  positive affect  negative affect  very negative effect  don't know

18. As a rancher, who do you feel best represents you in statewide hunter/rancher related issues? (Choose one)

- Montana Fish, Wildlife, and Parks
- Montana Stockgrowers Association
- Farm Bureau
- Montana Wool Growers
- Legislative Representative
- Yourself
- No One
- Don't Know
- other (please specify) \_\_\_\_\_

Please write any additional comments you have which relate to hunter/rancher relationships.

APPENDIX C

T-TEST ANALYSIS

Table 10. T-test analysis of hunter/rancher problems

Problems	Hunter <sup>a</sup>	Rancher <sup>a</sup>	P-value	SE
Damage to property by hunters	3.58	3.90	.01	.09
Litter from hunting	3.53	3.61	.50	.09
Too many hunters	3.85	3.93	.60	.10
Damage to roads	2.92	3.15	.08	.09
Driving off roads	4.15	4.68	.01	.09
Too little access	4.22	2.37	.01	.10
Lack of proper maps	3.09	2.58	.01	.10
Damage to livestock	2.49	2.83	.01	.08
Unclear property postings	3.73	2.47	.01	.09
Trespassing	4.12	4.61	.01	.09
Negative public statements by hunters	3.12	3.32	.14	.10
Negative public statements by ranchers	3.44	2.72	.01	.09
Abuse of land by hunters	3.36	3.53	.19	.09
Abuse of land by ranchers	2.80	1.85	.01	.08

<sup>a</sup> means from survey response with 1 being not a problem and 6 being a major problem.

Table 11. T-test analysis of hunter/rancher solutions

Solution	Hunter <sup>a</sup>	Rancher <sup>a</sup>	P-value	SE
Better communication between the two groups	4.83	4.65	.13	.08
Stiffer penalties for violators	4.37	4.86	.01	.10
More involvement by state and federal agencies	2.80	2.37	.01	.10
Less involvement by state and federal agencies	3.48	3.81	.06	.12
Shorter hunting seasons	1.75	3.32	.01	.10
Longer hunting seasons	2.91	2.04	.01	.11
Better boundary identification of public and private lands	4.73	3.67	.01	.10
More game wardens	2.92	3.28	.03	.11
Greater consideration for the concerns of the other group	4.85	4.43	.01	.09
Greater appreciation for the contributions of the other group	4.85	4.51	.01	.09

<sup>a</sup> means from survey response with 1 having low potential as a solution and 6 having high potential as a solution.

Table 12. T-test analysis for hunter/rancher questions

Experiences <sup>a</sup>	Hunter	Rancher	P-value	SE
Negative	1.15	1.06	.01	.01
Positive	1.81	1.53	.01	.02
Populations <sup>b</sup>				
Deer	1.19	1.26	.05	.02
Elk	1.80	1.55	.01	.05
Antelope	2.05	1.86	.05	.07
Hunting pressure and agriculture <sup>c</sup>				
Hunting pressure	2.12	2.28	.08	.06
Access to private lands	1.37	1.61	.01	.05
Effect of private land on wildlife	2.21	2.28	.20	.04
Effect of agriculture on wildlife habitat	2.26	1.52	.01	.06
Group representation <sup>d</sup>				
Representation	2.30	1.62	.01	.06
Non-respondents (N=50)			.80 <sup>e</sup>	.01

<sup>a</sup>means represent responses of 1 equal to yes and 2 equal to no.

<sup>b</sup>means represent response of population: 1 increasing, 2 decreasing, 3 remaining the same, and 4 don't know.

<sup>c</sup>means represent response of: 1 increased, 2 decreased, 3 remained the same and 4 don't know.

<sup>d</sup>means represent responses of representation: 1 Fish, Wildlife and Parks, 2 interest group, 3 legislative representative, 4 yourself, 5 no one and 6 don't know.

<sup>e</sup>Average of all responses.



APPENDIX D

ANALYSIS OF VARIANCE BY WEST, CENTRAL AND EAST AREA

Table 13. Analysis of variance for hunter/rancher problems by West, Central, and East Area

Problems	P-value
Damage to property by hunters	.04
Litter from hunting	.43
Too many hunters	.08
Damage to roads	.29
Driving off roads	.24
Too little access	.73
Lack of proper maps	.44
Damage to livestock	.65
Unclear property postings	.15
Trespassing	.51
Negative public statements by hunters	.36
Negative public statements by ranchers	.24
Abuse of land by hunters	.63
Abuse of land by ranchers	.54

Table 14. Analysis of variance for hunter/rancher solutions by West, Central, and East Area

Solutions	P-value
Better communication between the two groups	.92
Stiffer penalties for violators	.44
More involvement by state and federal agencies	.82
Less involvement by state and federal agencies	.28
Shorter hunting seasons	.10
Longer hunting seasons	.54
Better boundary identification of public and private lands	.96
More game wardens	.06
Greater consideration for the concerns of the other group	.12
Greater appreciation for the contributions of the other group	.15

Table 15. Analysis of variance for hunter/rancher questions by West, Central, and East Area

Experiences	P-value
Negative experience	.81
Positive experience	.29
Populations	
Deer	.06
Elk	.51
Antelope	.01
Pressure and Access	
Hunting pressure	.04
Access to private land	.30
Private land and agriculture	
Effects of private land on wildlife	.89
Effects of agriculture on wildlife habitat	.98

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