



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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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.

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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.















































































































