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FEE HUNTING OPPORTUNITIES ON PRIVATE LAND IN UTAH:
AN ECONOMIC AND POLICY ANALYSIS

By

Lucy Anne Jordan

A dissertation submitted in partial fulfillment
of the requirements for the degree
of
DOCTOR OF PHILOSOPHY
in
Range Science

UTAH STATE UNIVERSITY
Logan, Utah

1989

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I commend my two sons, Cedar and Forest, for coping with a mother under the stresses of graduate school. When the going got tough, they were always there to remind me of what is really important in life.

Last, I would like to extend my thanks to my parents for their encouragement and support, without which I would not have been able to complete my education.

This research project is dedicated to the people and resources of the State of Utah.

A handwritten signature in cursive script, reading "Lucy A. Judson". The signature is written in black ink and is positioned at the bottom right of the page.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	vi
LIST OF FIGURES	vii
ABSTRACT	ix
STATEMENT OF THE PROBLEM	1
Introduction	1
Dissertation Organization	3
Setting and Situation	5
1. Landownership Patterns in Utah	5
2. Wildlife Migration and Location	7
3. Wildlife Management	9
4. Programs Dealing with Deer and Elk on Private Land	12
5. Hunter Status	13
6. Landowner Status	14
7. Summary	15
Problem Statement	16
REVIEW OF THE LITERATURE	24
Definition	24
Philosophy and Legal Basis for Fee Hunting	25
Rationale for Fee Hunting	27
Fears and Caveats about Fee Hunting	28
How Fee Hunting is Managed	29
Landowner Motives	31
Investments in the Hunting Enterprise	31
Liability	31
Conclusions	32
METHODS	34
RESULTS	36
Description of the Agricultural Enterprise	36
1. Land Area	37
2. Sources of Income	37
3. Types of Agricultural Enterprises	40
4. Gross Receipts	44

5. Landowner Demographics 47

6. Discussion of Agricultural Enterprise Characteristics 51

 Description of the Hunting Enterprise 53

 1. Land Area Involved in Fee Hunting 53

 2. Economics of Fee Hunting 57

 3. Management of the Hunting Enterprise 66

 5. Discussion of Fee Hunting Enterprises 98

 Analysis of Relationships and Tests of Associated Hypotheses 105

 1. Factors Affecting Net Fee Hunting Income 105

 2. Factors Associated with Willingness of Landowners to Make Habitat Improvements 108

 Policy Analysis 112

 1. Introduction 112

 2. Effects of Fee Hunting on Landowners 113

 3. Effects of Fee Hunting on Hunters 118

 4. Effects of Fee Hunting on the Utah Division of Wildlife Resources 123

 5. Discussion 125

 6. Conclusions 129

CONCLUSIONS 135

LITERATURE CITED 140

APPENDIX 145

VITA 179

LIST OF TABLES

Table	Page
1. Income generating enterprises and percentage of landowners who earn income from each enterprise .	40
2. Size categories of number of cows in the breeding herd.	41
3. Size categories of number of ewes in the breeding herd.	42
4. Size categories for acres in crops.	43
5. Comparison of agricultural enterprise characteristic averages for deer and elk fee hunting landowners with Utah state averages.	45
6. Number of acres available for deer and elk fee hunting and percent of privately owned non-urban land in each county.	54
7. Investments made by landowners in their fee hunting enterprises.	72
8. Use of hunted land at other times of the year. . . .	74
9. Habitat improvements made by fee hunting landowners.	76
10. Percentage of hunts that include opportunities to hunt other animals as part of the deer or elk trespass fee.	80
11. Why landowners initiated fee hunting.	90
12. Opportunities landowners think they provide to hunters.	92
13. How landowners decided what to charge.	94
14. Problems encountered by landowners in initiating or running a fee hunting enterprise.	96
15. Advice or warnings for others considering initiating a fee hunting enterprise.	97

LIST OF FIGURES

Figure	Page
1. Map of Utah showing ownership status of land.	6
2. Map of Utah showing location of mountain ranges and streams.	8
3. Map showing elk herd units.	10
4. Map showing deer herd units.	11
5. Percentage of landowners by land size category. . .	38
6. Comparison of percentage of landowners by land size category.	39
7. Gross receipts categories for Utah ranches.	46
8. Number of years family or corporation has owned property.	48
9. Comparison of number of years on present farm. . . .	49
10. Landowner or operator age categories.	50
11. Approximate location of fee hunting enterprises. .	56
12. Average fees charged for various types of hunts. .	58
13. Frequency distribution of annual net cash income from fee hunting.	60
14. Percentage of gross ranch income contributed by income from fee hunting.	63
15. Expense categories for fee hunting landowners. . .	64
16. Average expenses for fee hunting landowners. . . .	65
17. Number of years landowner have been charging for deer and elk hunting on their property.	67
18. Percent of hunters who are Utah residents.	68
19. Amount of time spent by operator managing a fee hunting enterprise.	70

20(a) Percentage of landowners who have consulted with a wildlife biologist, (b) Employment of biologist landowners consulted.	75
21(a) Percentage of landowners who have made wildlife habitat improvements, (b) Percentage of landowners who make habitat improvement annually.	77
22. Percentage of landowners who offer opportunities for various deer and elk seasons.	79
23. Total number of paying hunters.	81
24. Number of paying hunters allowed on the property at one time.	82
25. Number of acres per hunter.	84
26. Restrictions and responsibilities of paying hunters by method of charging.	86
27. Services provided to hunters.	87
28. Number of services offered by hunt type.	89

ABSTRACT

Fee Hunting Opportunities on Private Land in Utah:
An Economic and Policy Analysis

by

Lucy A. Jordan, Doctor of Philosophy
Utah State University, 1989

Major Professor: Dr. John P. Workman

Department: Range Science

Objectives of this research were (1) to describe fee hunting as it is currently practiced in Utah and (2) to assess the adequacy of fee hunting efforts in addressing the problems of wildlife habitat and hunter access on private land. To collect information, Utah landowners who charged for deer (Odocoileus hemionus) or elk (Cervus elaphus) hunting in 1986 were surveyed by telephone and mail.

Compared to the average Utah livestock rancher, those involved in fee hunting have larger livestock operations and have owned their property longer. They are Utah natives. Fee hunting is concentrated in northern Utah where foothill and mountain rangelands are privately owned.

There is great diversity in the way fee hunting is organized and managed. Hunting opportunities sold by lease usually include few services and require hunters to post and patrol the property. Hunts sold by permit may include more services and be personally managed by the rancher. In general, fee hunting in Utah is differentiated from public land hunting by the availability of more acres per hunter rather than by special services or trophy animals. Fee hunting serves mostly resident hunters.

Average net annual cash income is \$6587, or \$0.66 per acre. The most common expenses incurred are for road and facility (fence, campsite) maintenance and vehicle costs. Highest expenses are those associated with providing services.

Landowners initiated fee hunting in order to gain control over trespassing and cover the costs of having hunters on their property. Most do not buy liability insurance.

Fee hunting is expanding the number and types of hunting opportunities and is meeting the needs of landowners to minimize costs of trespassing and hunters. However, fee hunting is not stimulating investments in wildlife habitat improvement. Because of intermingling landownerships and the migratory nature of deer and elk in Utah, investments in wildlife habitat or management have an uncertain return. It is unlikely that fee hunting can provide adequate incentives for improving wildlife habitat without substantial policy

changes to enhance the ability of landowners to capture a return on such investments.

(193 pages)

STATEMENT OF THE PROBLEM

Introduction

In Utah, as in many western states, big game migrate from publicly owned summer range to largely privately owned winter range. It is the availability and quality of winter habitat that sets the limit on deer and elk population sizes in most areas of Utah.

Approximately 43% of the available winter habitat required for present Utah deer and elk populations is privately owned. For some deer herds, over 90% of the required winter habitat is privately owned (Anonymous 1987).

Many landowners suffer property damage and hay, crop, and forage loss from wildlife use of their land during the fall, winter, and spring. The Utah Landowner Assistance Program provides compensation for hay and crop loss to a maximum of \$2000 per year, but does not cover forage or property (such as fence) loss. Under these circumstances, landowners have an incentive to use land and livestock management practices that discourage wildlife from coming onto their land.

Hunters and most other Utah residents want present population levels of big game maintained or increased (Krannich and Cundy 1987). Hunters also wish to retain hunting access to private land. However, problems with trespassing and disrespect for property have caused many landowners to try to

restrict public access to their property.

The Utah Division of Wildlife Resources (DWR), the agency responsible for managing wildlife for public benefit, tries to manage game populations so that they are high enough to satisfy hunters yet are still in balance with the available habitat. The DWR is therefore interested in encouraging landowners to provide or improve wildlife habitat. In addition, the DWR is interested in ensuring that hunters have access to publicly owned game animals for hunting and would like to reverse the trend of landowners restricting hunter access to their land.

Fee hunting, landowners charging hunters for trespass access to their property to hunt, has been proposed as one means of resolving or at least mitigating the problems associated with hunter access and wildlife habitat on private land. Proponents assert that when fees are charged, wildlife is viewed as an asset rather than a liability. Fee hunting gives landowners an incentive to (1) use agricultural practices which maintain or enhance wildlife habitat, (2) actively coordinate with state wildlife management agencies to manage wildlife to their mutual benefit, and (3) keep their lands open to hunters and provide a variety of hunting opportunities (Burger and Teer 1981, White 1986). Another benefit attributed to fee hunting is that it provides an additional income source and management objective for resource

owners who are all too often dependent solely upon income from agriculture, timber, or one of the extractive industries such as oil, gas and minerals. Thus, fee hunting many help buffer the economic swings common to agricultural or extractive products which have had such devastating consequences for economic stability of the ranch family and community as well as for the environment.

This research project was designed to determine if fee hunting as it is currently practiced in Utah does provide the predicted benefits mentioned above (or any others) and to what extent. An additional objective was to provide a thorough overview of fee hunting that can serve as a baseline reference for policy makers.

Dissertation Organization

This dissertation is organized into five major sections, some of which are further subdivided. The first major section is a Statement of the Problem, of which this subsection is a part. This section introduces the research that will be discussed in the dissertation and is divided into two further subsections. The Setting and Situation subsection describes the problems that fee hunting is hypothesized to help resolve. An understanding of the context in which fee hunting occurs is necessary in order to evaluate if, and how, fee hunting contributes to solutions.

The Problem Statement subsection presents the objectives

of this research project in detail. The relationships this research was designed to examine and test and their associated hypotheses are described.

The second major section is a Review of the Literature. In this section current thinking about the implications of fee hunting for wildlife policy and administration, property rights, and rancher economics is presented. In addition, results of research about fee hunting in other states are summarized so that they can be compared with results from Utah.

The third major section, Methods, describes how information for this research was collected and analyzed.

The fourth major section, Results, has been organized into several subsections. To meet the objective of providing detailed baseline information to policy makers, the first two subsections are descriptive. The first describes characteristics of agricultural enterprises involved in fee hunting. These characteristics are compared with averages for all Utah agricultural enterprises in order to illustrate special features of fee hunting agriculturalists. The second subsection describes fee hunting management, organization, and economics in detail. Where possible, comparisons with fee hunting in other states are made.

Following the descriptive subsections, and using information from them, the relationships and hypotheses listed

in the Problem Statement are tested and the results discussed.

The final subsection of the Results is a policy analysis. Information and results from the previous three subsections are used to evaluate whether, how, and to what extent fee hunting solves the problems of hunter access and wildlife habitat on private land.

The final major section is a Summary and Conclusions. This section includes a brief description of results and their implications for fee hunting policy.

Setting and Situation

1. Landownership Patterns in Utah

More than 70% of Utah's land area is in public ownership. Figure 1 shows the ownership status of land in Utah. Only the white areas are privately owned.

In this dry, mountainous state, privately owned land tends to be concentrated in valley bottoms and along watercourses. The early settlers preferred such areas because the land was arable, climate was milder, growing seasons longer, water was available or could be developed for irrigation, and transportation was easier.

Public land typically includes either mountain ranges or desert. This is particularly true of land in federal ownership. This land is managed for multiple uses such as livestock grazing, mineral, oil, and gas leasing, timber

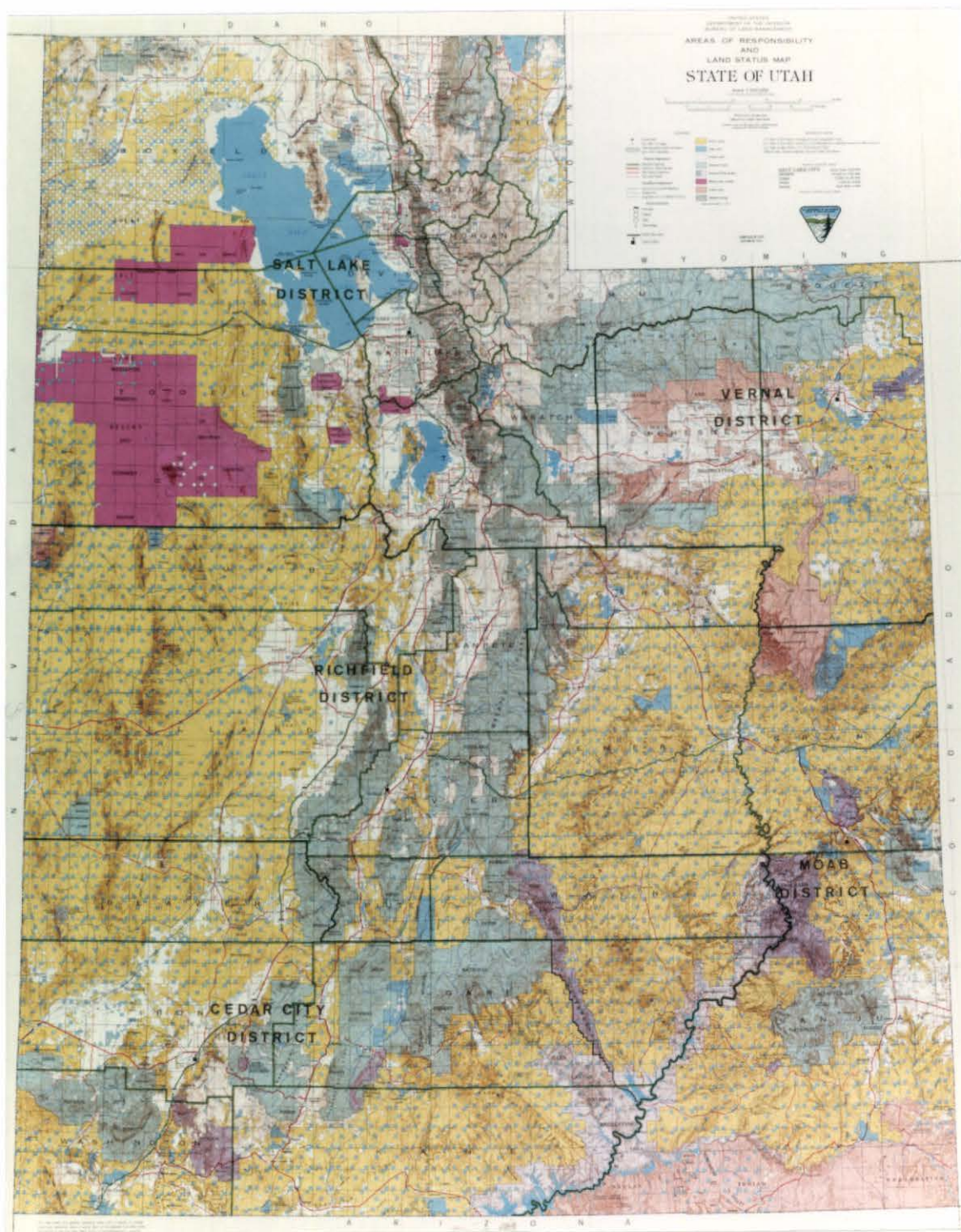


Fig. 1. Map of Utah showing ownership status of land. White areas are privately owned land.

harvesting, watershed protection, wildlife habitat, and recreation.

Figure 2 shows locations of mountain ranges and streams. The relationship between topography and landownership status is evident when Figures 1 and 2 are compared.

This division of land into topographic types and landownership status creates management problems for both public land management agencies and private landowners. For example, when land under different ownerships is intermingled, individual parcels may be difficult to manage for a particular use and their management may impact neighboring parcels. In addition, wildlife have no regard for political boundaries and roam freely through all landownership types.

2. Wildlife Migration and Location

In Utah, deer and elk spend the summer mostly on higher elevation ranges in the mountains. In most areas of the state, summer habitat is abundant even though these higher elevation ranges are also used for livestock grazing. Generally this summer range, being in the mountains, is publicly owned and managed.

To avoid deep snow and extend the length of time that forage is not covered with snow, deer and elk migrate to lower elevations to spend the winter. Winter forage is limited, and in fact, population levels of many deer and elk herds are determined by the availability and quality of winter habitat



Fig. 2. Map of Utah showing location of mountain ranges and streams.

(Anonymous 1987). These lower elevation valley bottoms are mostly privately owned. Deer and elk often congregate on private property during the winter, eating hay meant for livestock, breaking down fences, and trampling fields.

During spring and fall, deer and elk migrate through foothill ranges following the snowline up or down and searching out the earliest or latest green forage. These foothill ranges may be privately or publicly owned. Some privately owned foothill areas have been converted to dry land alfalfa production. Deer may graze alfalfa in these areas throughout the growing season rather than continuing to migrate farther up into the mountains.

3. Wildlife Management

The Utah Division of Wildlife Resources (DWR) manages deer and elk as herd units. A herd is a group of animals that tend to stay together throughout the year as they migrate from summer to winter range and back. The land area they typically occupy as they migrate during the year is the herd unit. Figures 3 and 4 show the deer and elk herd units for the state of Utah. In Figure 3, yellow areas indicate where 50% or more of the required annual habitat for present elk herd population sizes is on privately owned land. In Figure 4, green areas indicate where 50% or more of the winter habitat required for present deer herd population sizes is on privately owned land, and purple areas indicate where more than 75% of the winter

ELK HERD UNIT MAP

Dear Sportsman:
This map is provided to aid you in completing the enclosed harvest questionnaire. Please locate the location(s) you hunted and use the number circled in red to indicate what herd unit you hunted in. Your harvest information enables us to determine harvest and hunting pressure statistics.
Thank you for your time and cooperation.
Utah Division of Wildlife Resources

— Herd Area Boundaries

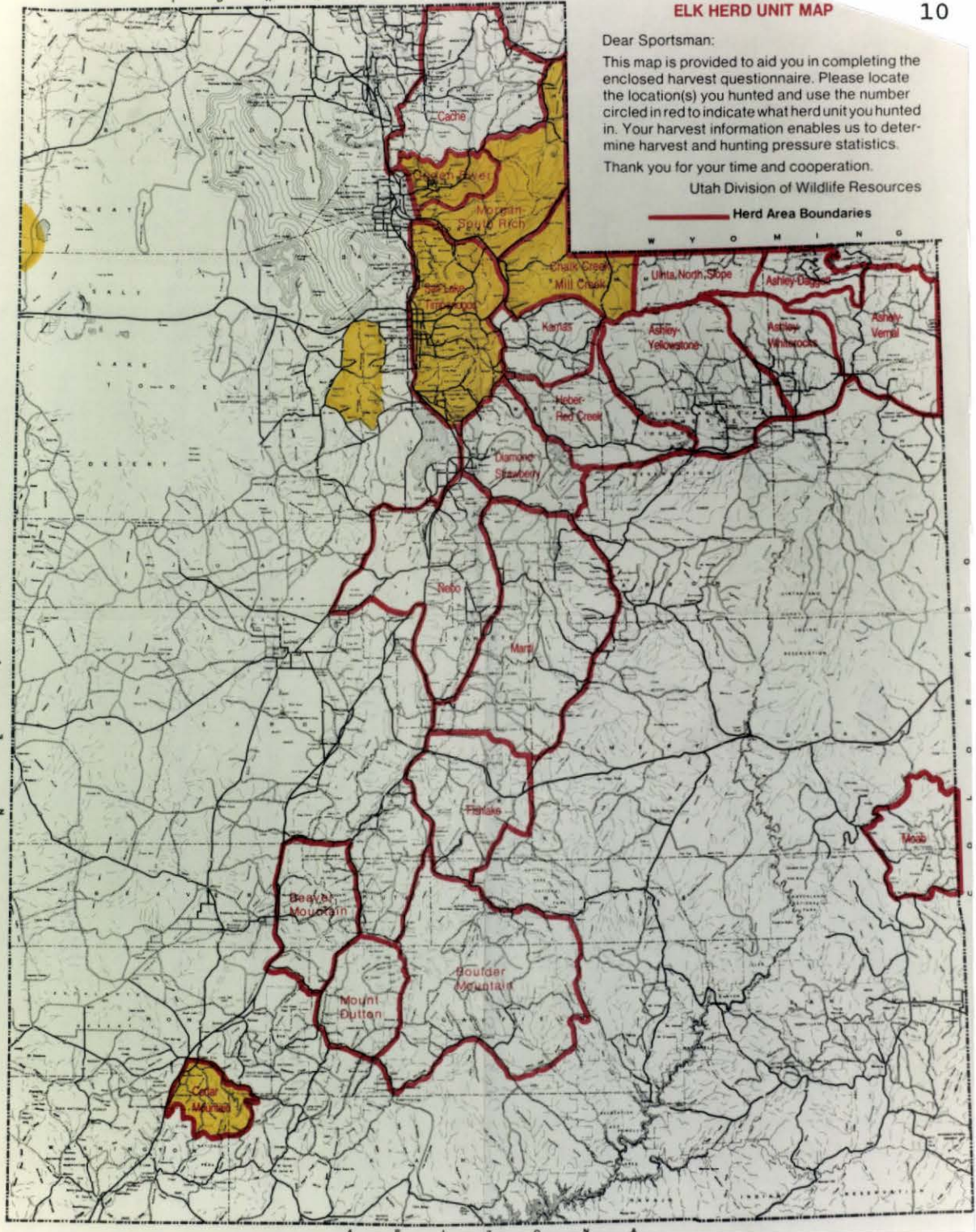


Fig. 3. Map showing elk herd units. Yellow areas are where >50% of required annual habitat is on private land.

DEER HERD UNIT MAP

Dear Sportsman:
This map is provided to aid you in completing the enclosed harvest questionnaire. Please locate the location(s) you hunted and use the number circled in red to indicate what herd unit you hunted in. Your harvest information enables us to determine harvest and hunting pressure statistics.
Thank you for your time and cooperation.
Utah Division of Wildlife Resources

— Herd Area Boundaries

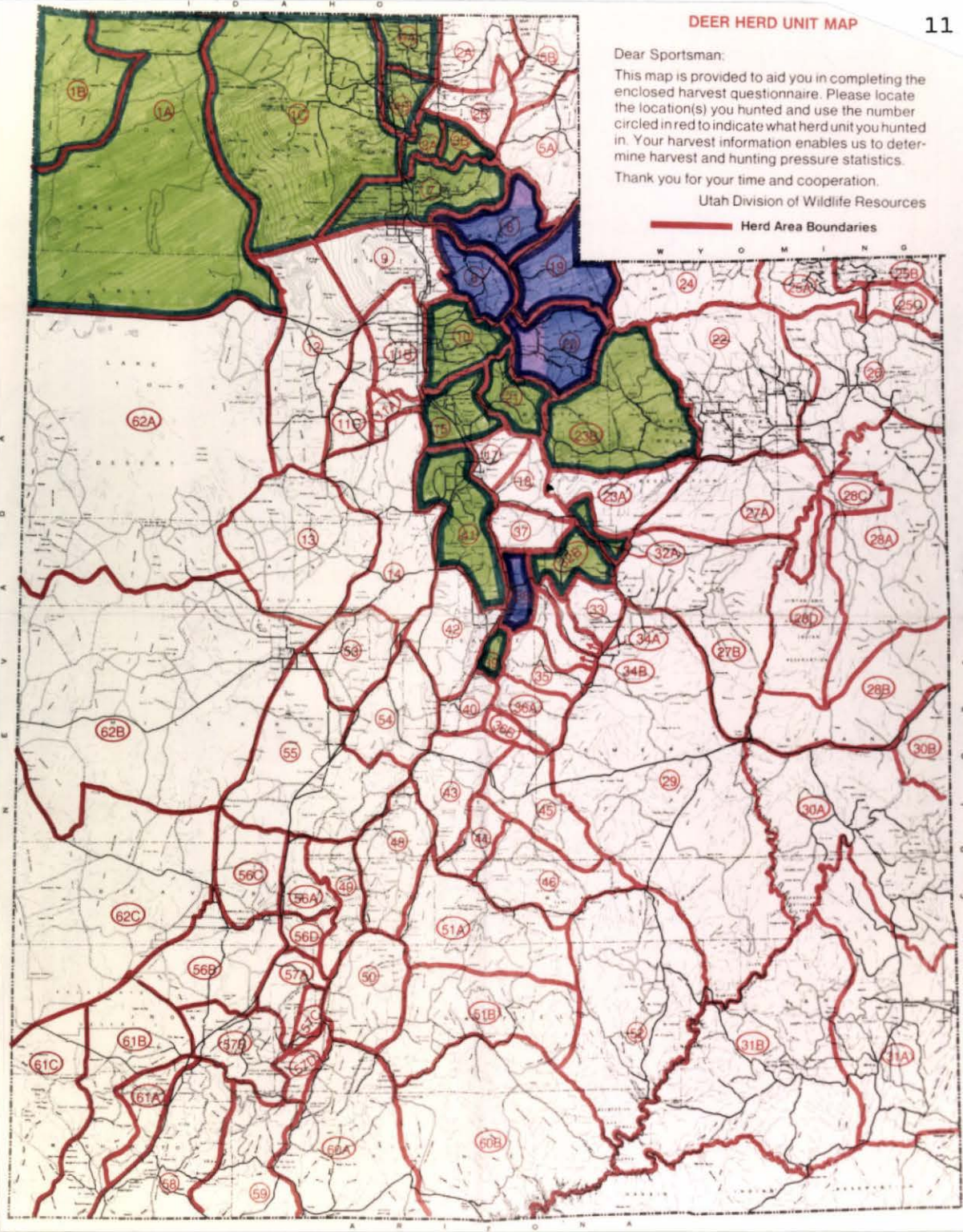


Fig. 4. Map showing deer herd units. Percentage of winter habitat on private land: green = >50%, purple = >75%.

habitat is on privately owned land. In four of these five herd units, more than 90% of the required winter habitat for deer is on privately owned land.

4. Programs Dealing with Deer and Elk on Private Land

The DWR has two programs to help conserve adequate habitat for deer and elk and mitigate problems caused by big game use of private land.

Purchasing Habitat and Habitat Easements

Where habitat is particularly limited or threatened, the DWR may try to purchase the land. If the land is not for sale, the DWR may try to obtain a habitat easement. With a habitat easement, the landowner agrees to use the land only in ways that do not jeopardize wildlife habitat. The DWR pays the landowner for any loss in income resulting from this restricted use. Easements can be for any length of time and with whatever restrictions are negotiated between the two parties.

Purchase of property or easements is limited by budgets, thus purchases cannot be viewed as a complete solution to the problems of wildlife use of private land under current budgetary practice. In the case of land purchase, not only must the cost of land be considered, money must be set aside for habitat management as well. As a result, purchase, while guaranteeing access to habitat, results in a continuous drain

on funds which could be used for other wildlife management activities.

An additional problem with land purchase is the fact that Utah is already over 70% publicly owned. Generally, Utah state government discourages the transfer of more private land to public ownership.

Landowner Assistance Program

The Landowner Assistance Program (LAP) is designed to help mitigate problems caused by wildlife on private land. DWR personnel will provide fencing and other materials, advice, and help with herding to prevent deer and elk from damaging or consuming crops. If those efforts fail, the DWR is authorized to pay landowners for the value of crops damaged or consumed. The maximum amount landowners may be compensated is \$2000 per year. This compensation does not cover property damage (such as fences damaged by elk) or value of forage consumed on privately owned rangelands.

5. Hunter Status

The number of big game hunters has stayed fairly stable at approximately 200,000 for the past 20 years (Anonymous 1987). However, the number of hunter days has nearly doubled, as has the number of trips hunters make during the hunting season. This means that hunters are going hunting more often or staying longer on each trip. Thus, although the number of

hunters has not increased, hunters report feeling more crowded.

Hunter success has been between 30% and 40% since 1975 when the buck only deer hunt was initiated (Anonymous 1987). Most of the bucks harvested are about 16 months old. Some hunters report dissatisfaction with the level of success and the lack of older, trophy bucks.

6. Landowner Status

Livestock ranchers have been in a cost/price squeeze for decades (Fowler and Torell 1987, Godfrey and Anderson 1989). Although there have been years when livestock and hay prices are up, these years occur sporadically and do not compensate for the many years in between when prices barely cover costs. In addition, the value of Utah agricultural land has been falling since 1982 (Hexem et al. 1988). This means that landowners have less equity to borrow against to cover operating expenses.

The bleak economic situation for livestock ranchers creates incentives to minimize all costs and seek other sources of income compatible with their livestock operation. Hunters and wildlife increase rancher costs by damaging property and consuming forage and crops that otherwise would be available for livestock. Fee hunting represents a way to gain additional income that is compatible with the livestock operation. In addition, by controlling hunter access and

behavior, fee hunting helps minimize costs incurred by having hunters and wildlife on the property.

7. Summary

Deer and elk require private land habitat for survival. As a result, private landowners bear the cost of providing that habitat so that the citizens of Utah have deer and elk to hunt and otherwise enjoy. The precarious economic situation for ranchers makes them less willing to provide free hunting opportunities and habitat for public wildlife. DWR programs help provide habitat and mitigate expenses, but funds are not available to purchase all the necessary habitat nor compensate landowners for all the expenses caused by wildlife. In addition, hunters are not entirely satisfied with the hunting opportunities being provided on public land through DWR wildlife management practices.

This situation provides an incentive and rationale for fee hunting. Fee hunting offers an opportunity for landowners to control costs and earn extra income. This, in turn, may make them more willing to provide habitat for deer and elk. Fee hunting also offers the opportunity to provide hunters with a variety of hunting experiences including fewer hunters, greater success rate, more opportunity for trophy animals, and mix of services.

Problem Statement

The intermingling landownership patterns, the migratory nature of deer and elk, the limitations in required winter habitat, and the growing polarization of opinions among groups desiring benefits from wildlife have stimulated a need for big game and fee hunting policy reevaluation. However, there has been no accurate information available upon which to base such a reevaluation. This research project was conceived to collect and analyze information on fee hunting so that it could be used by policy makers in redesigning policies relating to big game and private lands. In addition, this research project examines whether, and to what extent, fee hunting as it is currently practiced in Utah solves problems associated with hunter access and wildlife habitat on private land. Objectives and their associated hypotheses are as follows:

OBJECTIVE 1: To describe currently successful deer and elk fee hunting enterprises in Utah.

Because virtually nothing is known about fee hunting in Utah, the first objective is simply to learn as much as possible about fee hunting. Descriptive information desired includes:

1. Number of landowners involved in fee hunting
2. Amount of land involved in fee hunting, its location and use at other times of the year
3. Other income generating enterprises utilizing the same resources as fee hunting (for example, agriculture)

4. Characteristics of agricultural enterprises involved in fee hunting
5. Integration of the fee hunting enterprise into the agricultural enterprise
6. Management characteristics of the fee hunting enterprise
7. Revenues and expenses of fee hunting
8. Motives, problems, and satisfaction of landowners involved in fee hunting
9. Demographic information about landowners involved in fee hunting.

This descriptive information will be used to address several relationships deemed to be pertinent to those impacted by fee hunting (landowners, hunters, the DWR) or policy makers. Where testable hypotheses are appropriate, they have been listed. These relationships are:

- 1. Comparison of agricultural enterprises involved in fee hunting with those that are not now involved.**

This relationship is important because if fee hunting is a viable means of solving problems of hunter access and wildlife habitat on private land, then policy makers may want to encourage other landowners to become engaged in fee hunting. It is probable that those landowners most likely to be successful in fee hunting will have agricultural characteristics similar to those now successfully involved. Alternatively, it may be desirable to design policies which

help agriculturalists develop characteristics typical of those successfully involved in fee hunting.

2. Characteristics associated with higher fee hunting income.

It is assumed that the benefits to be derived from fee hunting are realized because income from fee hunting provides incentives to engage in certain activities. This assumption implies that improving net fee hunting income will create stronger incentives. In addition, more landowners may become interested in participating in fee hunting as potential income increases. Therefore, this research project will analyze factors hypothesized to influence net fee hunting income. The hypotheses to be tested are grouped into two categories and are listed below.

a. Influence of resource base on net fee hunting income.

- H1: Landowners with more privately owned acres earn higher net fee hunting income.
- H2: Landowners with more acres available for hunting earn higher net fee hunting income.
- H3: Landowners with larger livestock operations (more cows or sheep) earn higher net fee hunting income.
- H4: Landowners who run resorts earn higher net fee hunting income.
- H5: Younger landowners earn higher net fee hunting income.

b. Influence of management of the hunting enterprise
on net fee hunting income.

- H1: Landowners who sell trespass permits rather than leasing to clubs or outfitters earn higher net fee hunting income.
- H2: Landowners who allow hunting for more seasons earn higher net fee hunting income.
- H3: Landowners who offer a greater number of services earn higher net fee hunting income.
- H4: Landowners who offer guided hunts earn higher net fee hunting income.
- H5: Landowners with more than 50% non-resident paying ~~hunters~~ earn higher net fee hunting income.
- H6: Landowners who have been involved in fee hunting for more years earn higher net fee hunting income.
- H7: Landowners who demonstrate an interest in managing wildlife by censusing deer or elk, consulting with a wildlife biologist, or improving habitat, earn higher net fee hunting income.
- H8: Landowners who restrict the numbers of hunters on their property earn higher net fee hunting income.

**3. Characteristics associated with the willingness of
landowners to invest in wildlife habitat
improvements.**

Because deer and elk require private land habitat to maintain present population levels, and because the DWR and

hunters want population levels kept as high as the available habitat will allow, the DWR and hunters are interested in ways to improve or increase wildlife habitat on private land. Fee hunting may provide an incentive for landowners to improve habitat. The descriptive information mentioned earlier will ascertain to what extent landowners do maintain or improve wildlife habitat. It is of additional interest to identify factors associated with willingness of landowners to make habitat improvements so that efforts can be made to create those circumstances for other landowners and thus potentially increase the number of landowners who maintain or improve habitat. This research will examine factors hypothesized to be associated with willingness of landowners to make habitat improvements. The hypotheses to be tested are grouped into two categories and are listed below.

a. Influence of resource base on likelihood of improving habitat.

- H1: Landowners with higher gross ranch income improve habitat.
- H2: Landowners with a higher percentage of gross ranch income contributed by income from the hunting enterprise improve habitat.
- H3: Landowners with more privately owned acres improve habitat.
- H4: Landowners with larger livestock operations (more cows or sheep) improve habitat.

H5. Landowners who charge for small game hunting as well as for deer and elk hunting improve habitat.

H6: Younger landowners improve habitat.

b. Influence of management of the hunting enterprise on likelihood of improving habitat.

H1: Landowners who earn higher net fee hunting income improve habitat.

H2: Landowners who offer more services improve habitat.

H3: Landowners who offer guided hunts improve habitat.

H4: Landowners who restrict the number of hunters improve habitat.

H5: Landowners who run resorts improve habitat.

H6: Landowners who have been involved in fee hunting for more years improve habitat.

H7: Landowners with more than 50% non-resident paying hunters improve habitat.

H8: Landowners who census deer and elk or consult with a wildlife biologist improve habitat.

H9: Landowners with more land available for hunting improve habitat.

OBJECTIVE 2: To assess the adequacy of current fee hunting efforts in addressing the problems of wildlife habitat and hunter access on private land in Utah.

The information described and analyzed for the first objective will be used in a policy analysis assessing whether fee hunting as it is currently practiced in Utah is effective

in resolving or mitigating perceived problems of wildlife habitat and hunter access on private land. The analysis will discuss how well fee hunting meets the needs or expectations of landowners, hunters, and the Utah Division of Wildlife Resources. Judgments will be based on their respective perceptions and stated opinions when more objective or quantitative means of assessment are not available. Assessment will be according to the following criteria:

1. Landowners

- a. wildlife or hunter management goals are met
- b. net revenue is positive
- c. average time landowners have been involved in fee hunting is more than two years (i.e. landowners do not try it, decide they don't like it, and quit)
- d. landowners express satisfaction with their involvement in fee hunting

2. Hunters

- a. a range of hunting opportunities is available that is different from public land hunting opportunities, e.g.
 1. number of hunters is restricted resulting in greater privacy for paying hunters
 2. trophy animals are available
 3. there is a likelihood of more eligible animals per hunter

4. services such as guiding and lodging are available

b. local or resident hunters avail themselves of fee hunting opportunities

3. Utah Division of Wildlife Resources

a. landowners coordinate management goals with the DWR

b. private land habitat is maintained or improved

c. resident hunters avail themselves of fee hunting opportunities

REVIEW OF THE LITERATURE

Much of the literature about fee hunting explains its history and rationale rather than giving many specific details about economics and management. There have been very few detailed or comprehensive published studies. The discussion which follows will review current views on the definition of fee hunting and rationale and motives for being involved in fee hunting. In addition, legal issues, management, investments, and liability will be discussed.

Definition

Any discussion of fee hunting must begin with a definition. White (1987) included fee hunting as one facet of big game ranching, which he defined as "the intentional raising of wildlife ungulates for any purpose" (p. 3). Intentional management, including the effects of harvest, is a requirement of this definition. Note that this definition does not specify who owns the animals that are intentionally raised. Laycock (1987), on the other hand, is careful to distinguish between the concepts of privatization of wildlife, where private landowners both own and manage game animals, game ranching, in which wild game animals are raised behind fences but are still publicly owned, and fee hunting. In his view, fee hunting refers to a situation where game animals remain in public ownership and are free-ranging, but hunter

access to private land is restricted and available only for a fee.

The confusion in these terms has been accidental in some cases, but appears deliberate in others. For example, as discussed by Laycock (1987), the Wyoming Game and Fish Department and the Wyoming Wildlife Federation equate fee hunting with privatization or commercialization and use the terms interchangeably in their efforts to influence the public against fee hunting. Because privatization and game ranching imply a change in ownership of public game (either legally or de facto), use of these terms is an effective scare tactic. Confusion in terms, however, prevents rational consideration of the differences in these wildlife ownership and management strategies and their associated risks and benefits.

Philosophy and Legal Basis for Fee Hunting

Wildlife in the United States is publicly owned. Wildlife is held in trust and managed by the states and by the federal government (Matthews 1986). Hunting has always been a right of all citizens. Rights in real property are firmly established in the Constitution (Jackson 1980).

Wildlife is both a fugitive resource and a public good. Wildlife migrate through all types of land ownerships, public and private, and require certain habitats for their existence regardless of who owns those habitats. Yet wildlife is not owned by any one individual, they are managed to provide

benefits for everyone. Possession can only occur as a result of a legal kill (under rules set by either the state or the federal wildlife management agencies). Thus we have a situation where a publicly owned and managed resource depends for its existence upon privately owned resources whose owners cannot derive direct returns from this contribution. One result is that landowners provide less habitat for wildlife than is publicly desired because landowners cannot capture a return on the investment (Jackson 1980, Bishop 1981).

To resolve this dilemma, Leopold (1930) proposed three approaches. The first is simply to buy the land required for wildlife. Clearly, this is most feasible for lands with low income potential from other uses. The second approach is to provide compensation to landowners for their contributions to wildlife habitat. Compensation can take the form of subsidies for activities that preserve or improve habitat, provision of materials (such as seeds) and technical advice for habitat improvement activities, and direct payments (Burger and Teer 1981, McConnell 1981, Teer et al. 1983). Compensation can come from either government agencies or private individuals and groups concerned about wildlife. Fee hunting falls into this latter category. Leopold's third suggestion is to cede title to game to those who provide habitat. This is privatization, and is, so far, politically unacceptable in the United States. Besides Leopold's suggestions, Bishop (1981) mentions the use of taxation and regulation as methods which change the

incentives for landowners and help resolve the problem of market failure.

Rationale for Fee Hunting

The primary rationale for fee hunting is that it provides compensation to landowners for the costs they incur as a result of the presence of wildlife on their property (Applegate 1981, Berryman 1981, Bishop 1981, McCorkle 1981, White 1986). In addition, fee hunting fits into a broader picture of a growing demand for and recognition of the recreation opportunities provided by private lands (Doig 1986, Sampson 1986). The assumption is that when fees are paid, landowners realize a value from recreation and wildlife and as a result will manage for them.

The benefit of assigning a more concrete expression of value to wildlife and recreation has also stimulated consideration of charging fees for hunting and other recreational uses of public land (Thomas 1984, Davis et al., 1987, Anonymous 1988). This would allow such uses to compete more effectively with timber and other commodity products.

In Utah, one possible use of fee hunting is on the state school land. State school land is managed to maximize income to support schools. There has been some discussion about whether income could be increased on these lands by leasing hunting rights, either instead of or in addition to leasing for livestock grazing (Bedrossian and Hein 1985, Pratt 1988).

Fears and Caveats about Fee Hunting

The status of wildlife as a common pool resource resulted in decimation and even extinction of many wildlife species by the early 1900's (Tober 1981). A belated recognition of wildlife scarcity combined with the end of the frontier era stimulated Americans to more actively manage and conserve wildlife (Svoboda 1981). Strict hunting regulations and lack of legal markets for wildlife products has since led to recovery, and even record population numbers, of some species. There are some who fear that any type of commercialization or privatization of wildlife will jeopardize this remarkable recovery by leading to uncontrollable poaching (Geist 1985). While these fears are mostly directed at game ranching, the lack of distinction in terminology between game ranching and fee hunting has resulted in attaching a similar fear to fee hunting.

Hunters have viewed their right to hunt as including the right to have a place to hunt (Burger and Teer 1981). As long as there was wilderness in America, this concept was not challenged. The existence of large amounts of public land in some states and a tradition of free private land access in others has reinforced this belief. As a result, fee hunting is viewed by many hunters as an abridgement of their basic right to hunt because it restricts where they may hunt.

Another source of distrust of fee hunting comes from state wildlife management agencies. They are the ones charged

with managing wildlife for the public trust. Typically, they are trained as wildlife biologists and thus view themselves as more capable of making decisions about wildlife than others. Although they are aware of wildlife needs for private land habitat, they are not necessarily willing to view private landowners as true partners in wildlife management. Fee hunting threatens their hegemony over wildlife. For example, Kruckenberg (1987) states "more control of licensing, increased involvement in decision making, increased management authority and more profit from wildlife-based operations"(p. 4), or "any intrusion into the current system of control, propagation, management, protection and regulation of all Wyoming wildlife and associated recreation, constitutes 'privatization' of that wildlife resource"(p. 4) and "the Wyoming Game and Fish Department is opposed to privatization in any way, shape or form" (p. 4). (It is of interest to note that in this same article it is stated that those who are not to have any increased involvement in decision making provide 44% of the forage consumed by big game animals in the state of Wyoming.)

How Fee Hunting is Managed

There is a great deal of variation in how fee hunting is organized and managed. For example, Steinbach et al. (1987) state that hunting in Texas is usually sold through leases, and these are of four principal types, annual, day hunt, by

the animal, and secondary leases to an outfitter or club. New Mexico fee hunting opportunities are made available through permits, primarily because landowners are issued permits by the New Mexico Game and Fish Department based on a complex formula determining the contribution of their land to the habitat requirements of a particular game species. These permits can be used by a landowner any way he chooses, including resale to hunters (Morgan 1988). Gynn and Schmidt (1984) mention the use of leases in Colorado, with season or long-term leases giving the most satisfaction. Landowners enrolled in experimental programs in Colorado and California may market permits (Anonymous 1986).

In addition to the lease and permits systems typical of fee hunting, private land hunting opportunities are also made available through shooting preserves, lease of waterfowl blinds, and commercial membership enterprises (Applegate 1981, Shelton 1987).

Authors who have researched fee hunting state that landowners manage their fee hunting enterprises in ways that suit their resources and tastes (Gynn and Schmidt 1984, Steinbach et al. 1987, Morgan 1988). There are almost as many variations in fee hunting management as there are landowners managing fee hunting. It appears that one of the distinctive features of fee hunting is its diversity.

Landowner Motives

Landowners restrict access to their land primarily because of hunter behavior (Guynn and Schmidt 1984, Wright and Kaiser 1986, Knight et al. 1987). The most important benefit landowners get from fee hunting is control over hunter numbers and behavior. Although the usual rationale given for landowner interest in fee hunting is compensation for wildlife and hunter costs, income is not listed as the most important benefit of fee hunting by most landowners. Fee hunting income is usually only a small percentage of gross ranch income (Guynn and Schmidt 1984, Bedell 1987, Morgan 1988).

Investments in the Hunting Enterprise

Very few landowners engaged in fee hunting change their principal land use to derive more income from hunting, nor do they make many capital investments in the hunting enterprise. Those investments that are made provide hunter amenities or improve control over hunters and wildlife. Most landowners do not invest in wildlife habitat improvements, presumably because the expected return is low or uncertain (Applegate 1981, Burger and Teer 1981, Shelton 1987, Wiggers and Rootes 1987, Morgan 1988).

Liability

An important concern of landowners considering developing recreation opportunities on their land is liability (Guynn and

Schmidt 1984, Shelton 1987). Despite this concern, Morgan (1988) reports that only 15% of fee hunting landowners in New Mexico purchased extra liability insurance and only 16% had hunters sign a waiver of liability. Horvath (1986), Kozlowski (1986), and Mukatis (1987), review the current legal definitions of various classes of private land users (such as paying guest or trespasser) and the liability attached to each. Church (1979) describes a new model act on access, liability, and trespass. Utah has passed an act based on this model (Bunnell, pers. comm.)

Conclusions

Conclusions that can be drawn about fee hunting at this time are:

1. Fee hunting enterprises are very diverse, making generalizations about economics and management strategies difficult.
2. Landowners are motivated to initiate fee hunting from a desire to regulate hunter behavior and prevent property damage. Consideration of additional income is rated as a much less important incentive.
3. Income from fee hunting is low, usually less than 10% of gross property income. Generally, landowners do not alter their other land uses in order to increase income from fee hunting. They view fee hunting as a sideline.
4. Liability is a concern, but landowners do not necessarily

purchase special liability insurance or have hunters sign a waiver of liability.

5. Fee hunting has not stimulated landowners to make investments in wildlife habitat improvements.

METHODS

Landowners who obtained revenue by providing deer (Odocoileus hemionus) and elk (Cervus elaphus) hunting opportunities on their land in 1986 were surveyed by telephone and mail using the Dillman method (Dillman 1978). Copies of the survey instruments are in the Appendix. Information was collected about hunting opportunities landowners provide, size and type of agricultural enterprise, and revenues, expenses, and management practices associated with the hunting enterprise.

An effort was made to contact every landowner in the state of Utah who charged for deer and elk hunting in 1986. Altogether, 121 landowners were discovered, and 117 (97%) completed telephone interviews. Follow-up mail questionnaires were sent to all landowners who completed telephone interviews. The return rate for the mail questionnaires was 82%.

Responses were coded for computer and analyzed using Lotus 1-2-3 and SPSS-X.

Many landowners offered several types of hunting opportunities differentiated by type of animal, season, responsibilities of hunters, and services provided. Results presented here are for 114 landowners offering 151 different hunting opportunities.

Although the response rate was quite high for the

questionnaires, it was variable for individual questions. Therefore, a no response percentage is reported whenever appropriate. Also, many landowners gave more than one response to certain questions. Therefore, percentages of responses may add up to more than 100%.

RESULTS

Results will be reported in four sections. The first section will be a description of agricultural enterprises involved in fee hunting and how they compare to the average of all Utah agricultural enterprises. The second section will discuss the economics and management of fee hunting enterprises. Opinions and perceptions of landowners managing fee hunting enterprises will also be presented and discussed. The third section will discuss the analyses conducted and hypotheses tested using the information described in the first two sections. The fourth section will be a policy analysis based on the descriptions and analyses discussed in the previous three sections.

Description of the Agricultural Enterprise

This section describes characteristics of agricultural enterprises involved in fee hunting. These characteristics are compared to averages for all Utah agriculturalists. The purpose of the description and comparisons is to identify any features which distinguish agriculturalists who provide fee hunting from those who do not. If policy makers become interested in expanding fee hunting, they will want to know which landowners can initiate fee hunting most easily or would most likely be successful at it. Clearly, enterprises most similar to agriculturalists already successful in managing fee hunting are likely candidates.

1. Land Area

Landowners involved in fee hunting for deer and elk in 1986 own an average of 15,935 acres. Figure 5 shows the percentage of landowners by land size category for privately owned land and land available for fee hunting. Ninety-five percent of landowners own more than 1,000 acres and 31% own more than 10,000 acres. Only 1% of landowners own less than 500 acres.

In 1986, the average farm size in Utah was 832 acres for all farms (Utah Agricultural Statistics 1987). The 1982 Census of Agriculture (U.S. Dept. of Commerce 1984) reports an average farm size of 1,136 acres for livestock farms in Utah. Figure 6 compares the land size categories for fee hunting landowners with those for Utah landowners who derive the majority of their income from livestock. Clearly, it is the larger landowners who are involved in Utah fee hunting.

2. Sources of Income

Table 1 shows the types of enterprises which generate income for fee hunting landowners and the percentage of landowners who earn income from each enterprise. As expected, most landowners are agriculturalists, raising livestock or crops. Those that do not ranch themselves lease their land to others for agricultural uses. The most important source of income for landowners after agricultural production is mineral, gas, or oil leasing.

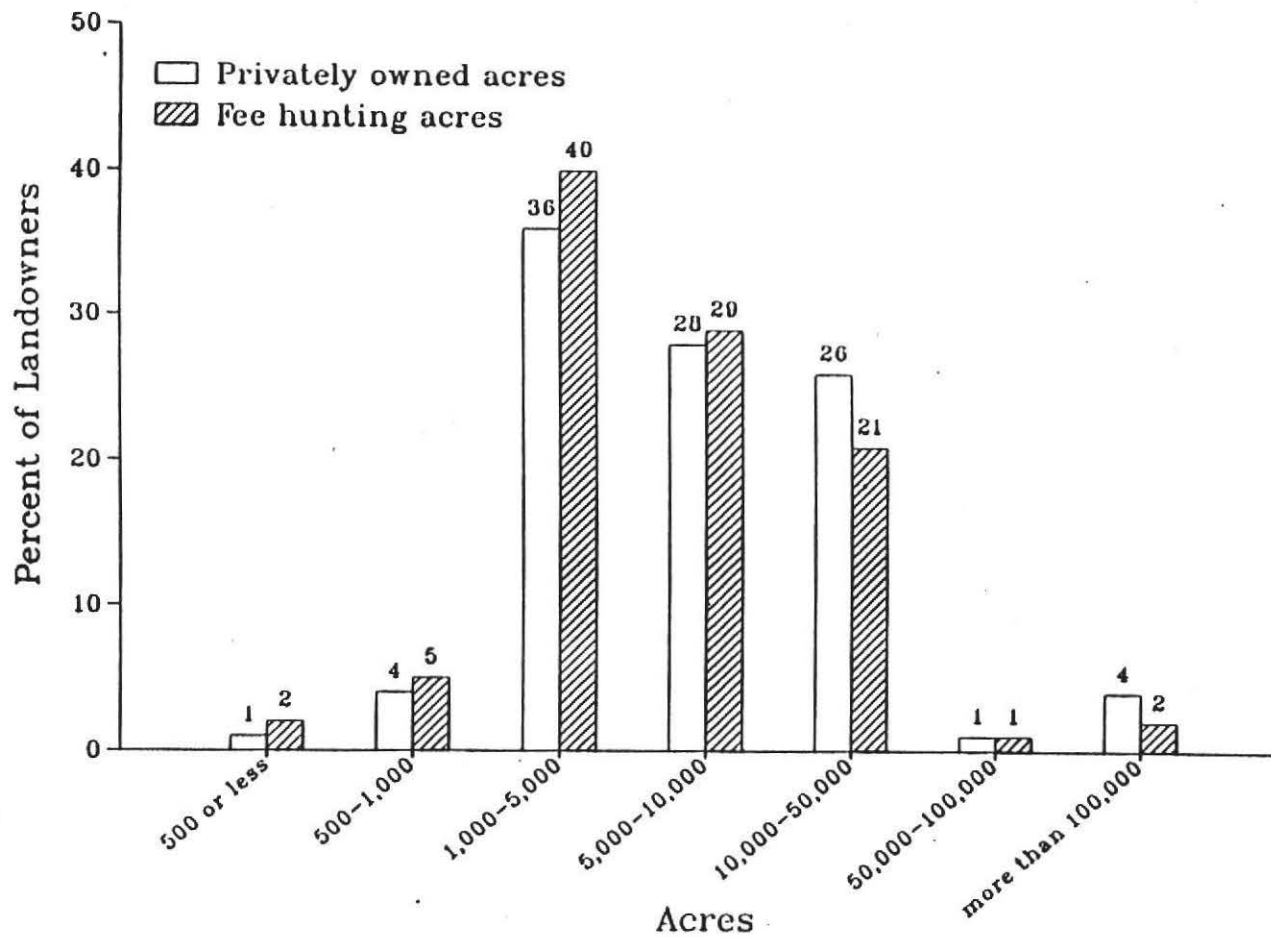


Fig. 5. Percentage of landowners by land size category.

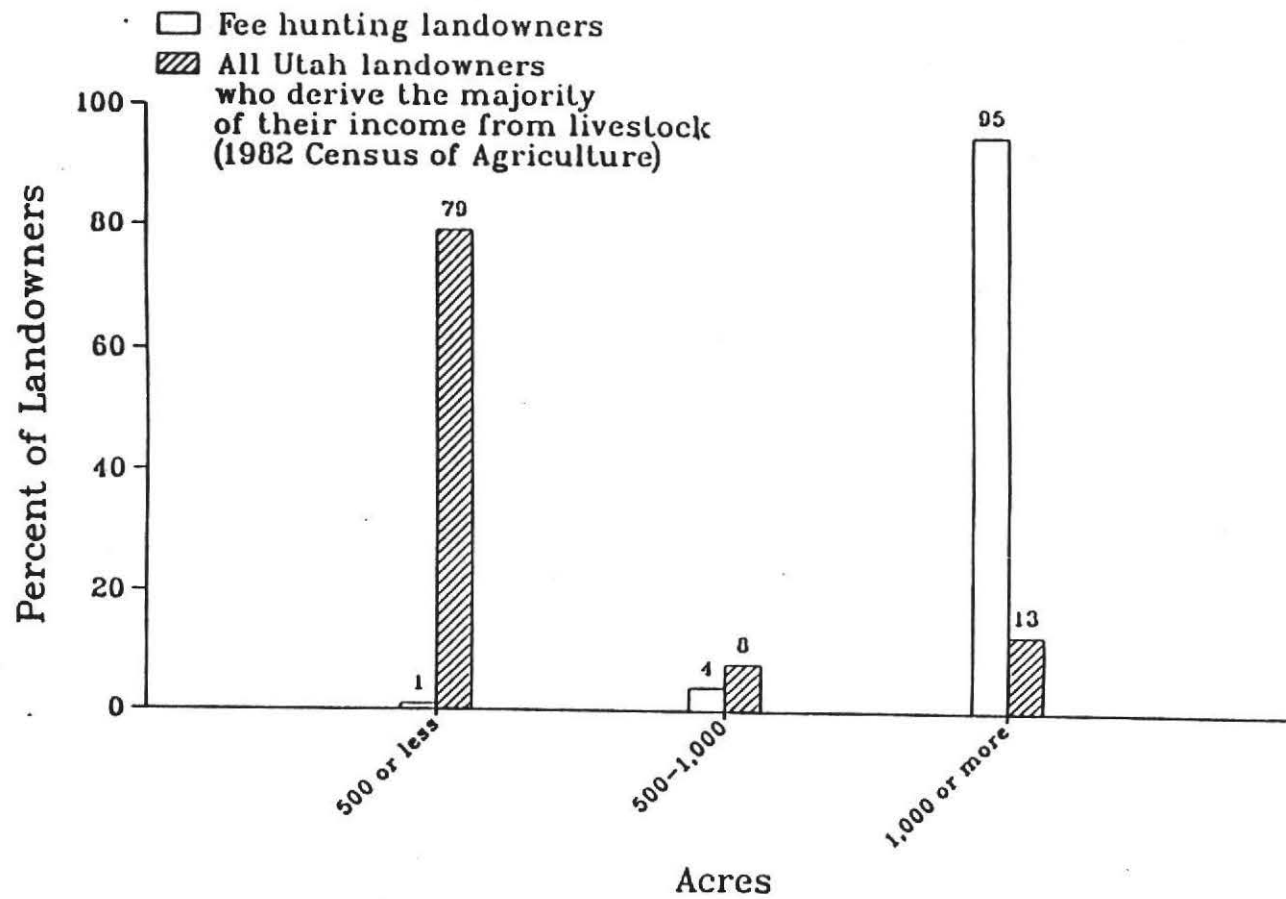


Fig. 6. Comparison of percentage of landowners by land size category.

Table 1. Income generating enterprises and percentage of landowners who earn income from each enterprise.

<u>ENTERPRISE</u>	<u>PERCENTAGE OF LANDOWNERS</u>
Raise cattle	57
Raise sheep	39
Raise crops	52
Raise horses	23
Run a resort	4
Lease to others for farming for ranching	29
Trapping	6
Small game hunting	7
Timber	12
Mineral/gas/oil leasing	23
Other	6

3. Types of Agricultural Enterprises

Fifty-seven percent of the landowners raise beef cattle and 39% raise sheep. Of those, thirty-three percent raise beef cattle only, 13% raise sheep only, and 25% raise both beef cattle and sheep.

Cattle Enterprises

Most cattle ranchers run cow-calf operations (68%). Thirty-two percent run cow-calf-yearling operations, and 5%

run stocker, purebred, or other types of beef operations. Average number of cows in the breeding herd at January 1 inventory was 411, with a minimum of 10 and a maximum of 3500. Table 2 shows the breeding herd size categories for beef cattle ranchers. Note that about half run a herd size of 500 or fewer cows. More than one-third of the ranchers declined to give information on the size of their breeding herd.

Table 2. Size categories of number of cows in the breeding herd. Categories were based on natural divisions occurring in the data.

Category	<u>Percentage</u>
10 - 500	46
500 - 3,500	17
No response	37

In comparison, the average number of cows in the breeding herd at January 1, 1986 inventory was 43 for all farms which raise beef cattle (Utah Agricultural Statistics 1987). The average was 56 for farms which derive their principal income from livestock (U.S. Dept. of Commerce 1984).

Sheep Enterprises

Sheep ranchers usually run ewe-lamb operations marketing either feeder lambs (62%) or fat lambs (60%), with many

ranchers doing both. Eighteen percent run purebred operations, and 13% run some other type of sheep operation. Average number of ewes at January 1 inventory was 1,982, with a minimum of 7 and a maximum of 11,000. Table 3 shows the size categories for number of ewes in the breeding herd for sheep ranchers.

Table 3. Size categories of number of ewes in the breeding herd.

<u>Category</u>	<u>Percentage</u>
7 - 1,000	33
1,000 - 5,000	26
5,000 - 11,000	6
No response	35

The average number of ewes at January 1, 1986 inventory for all farms with sheep was 20 (Utah Agricultural Statistics 1987). This is in contrast to an average of 208 in 1982 for those farms which derived the majority of their income from livestock (U.S. Dept. of Commerce 1984).

Crops

Average number of cropped acres was 905, with a minimum of 2 and a maximum of 5,900. Table 4 shows the size categories of crop acreages reported by landowners. The 1982 Census of

 Table 4. Size categories for acres in crops.

<u>Category</u>	<u>Percentage</u>
2 - 500	41
500 - 1,000	6
1,000 - 6,000	20
No response	33

Agriculture (U.S. Dept. of Commerce 1984) reports an average of 63 acres of harvested cropland for farms whose principal income is derived from livestock.

Crops raised include alfalfa (67%), meadow hay (62%), small grains such as wheat and barley (52%), field corn (18%), pinto beans (6%), improved pasture such as crested wheatgrass (42%), and other (27%).

Horses

Twenty-three percent of landowners mentioned that they kept their own horses either for pleasure or to help with livestock work. Most landowners who kept horses did not specify how many horses they had. For those that did, the average number of horses kept was 37, with a minimum of 12 and a maximum of 100. Livestock ranchers kept an average of 5 horses in 1982 (Dept. of Commerce 1984).

Summary

Utah Agricultural Statistics (1987) and the 1982 Census of Agriculture (U.S. Dept. of Commerce 1984) both report smaller averages for cows or ewes in the breeding herd and cropped acres than found in this study. Table 5 compares various agricultural characteristics of fee hunting enterprises with Utah averages. Taken with the data on average number of privately owned acres per landowner, it is obvious that fee hunting landowners in general have larger livestock operations than the average Utah livestock rancher.

4. Gross Receipts

Landowners were asked to indicate the gross receipts category for all sources of income derived from their land including such activities as timber sales and oil, gas, or mineral leases. Twenty-five percent of fee hunting landowners reported gross receipts from all sources to be greater than \$100,000. Twenty percent reported gross receipts between \$20,000 and \$100,000, and 22% reported gross receipts less than \$20,000. One-third declined to respond.

Figure 7 shows a frequency distribution of gross receipts compared with farm revenues for all Utah agriculturalists. Since farm revenue data for all Utah agriculturalists does not include income from activities such as mineral leases or timber sales, comparisons are only approximate.

Table 5. Comparison of agricultural enterprise characteristic averages for deer and elk fee hunting landowners with Utah state averages.

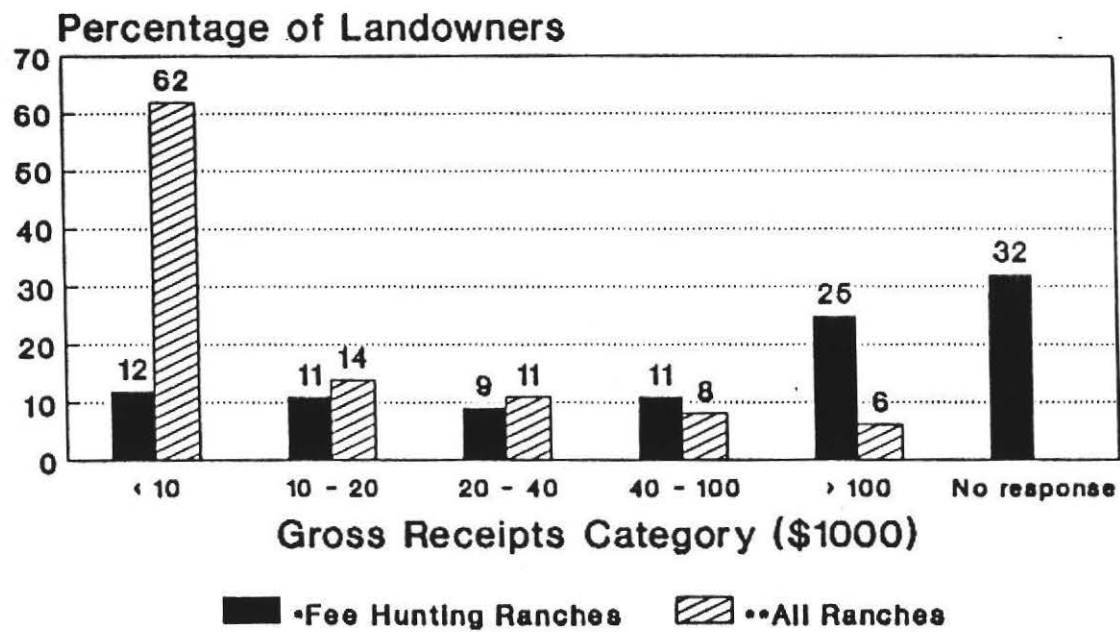
<u>Characteristic</u>	<u>Fee Hunting Ranches</u>	<u>All Farms with Livestock*</u>	<u>Livestock Ranches**</u>
Number of acres	15,935	832	1,136
Number of cows in breeding herd	411	43	56
Number of ewes in breeding herd	1,982	20	208
Number of cropped acres	905	-	63
Number of years on present farm	56	-	20

* Utah Agricultural Statistics for 1986 (1987). Figures are for all farms which raise beef cattle, sheep, or crops respectively.

** 1982 Census of Agriculture for Utah (U.S. Dept. of Commerce 1984). Figures are for all farms which derived the majority of their income from livestock.

Most livestock ranchers in Utah earn less than \$10,000 gross returns. In contrast, fee hunting ranchers appear to be more evenly distributed throughout the income categories, with only 12% earning less than \$10,000. Fully one-fourth earn more than \$100,000.

Gross Receipts Categories for Utah Ranches



•Gross receipts from all sources except off farm employment
 ••Gross farm sales for livestock farms

Fig. 7. Gross receipts categories for Utah ranches.

5. Landowner Demographics

Number of Years Families Have Owned Their Land

Families or corporations involved in fee hunting have owned their land for 56 years on the average. This compares with an average ownership tenure of 20 years for all Utah livestock farms as reported by the 1982 Census of Agriculture (Table 5). Figure 8 shows a frequency distribution of number of years fee hunting landowner families or corporations have owned their property. The minimum number of years mentioned was 1, the maximum 100, and the most frequently mentioned number of years was 50. Figure 9 compares the number of years fee hunting landowners have owned their property with years of ownership of all Utah livestock ranchers.

Landowner Age and Education

Forty percent of landowners were over age 55 in 1986, and 38% were younger (22% declined to respond). Figure 10 compares the age categories of fee hunting landowners with those of Utah livestock operators. In general, it appears that fee hunting landowners do not differ in age from other livestock ranchers.

Eighty-one percent of fee hunting landowners had attended high school, 47% had attended or completed college, and 8% had some graduate education. Most spent the years from ages 10 to 18 in Utah (75%). However, a few had been raised in Idaho, Colorado, Nevada, Wyoming, or elsewhere (about 1% each).

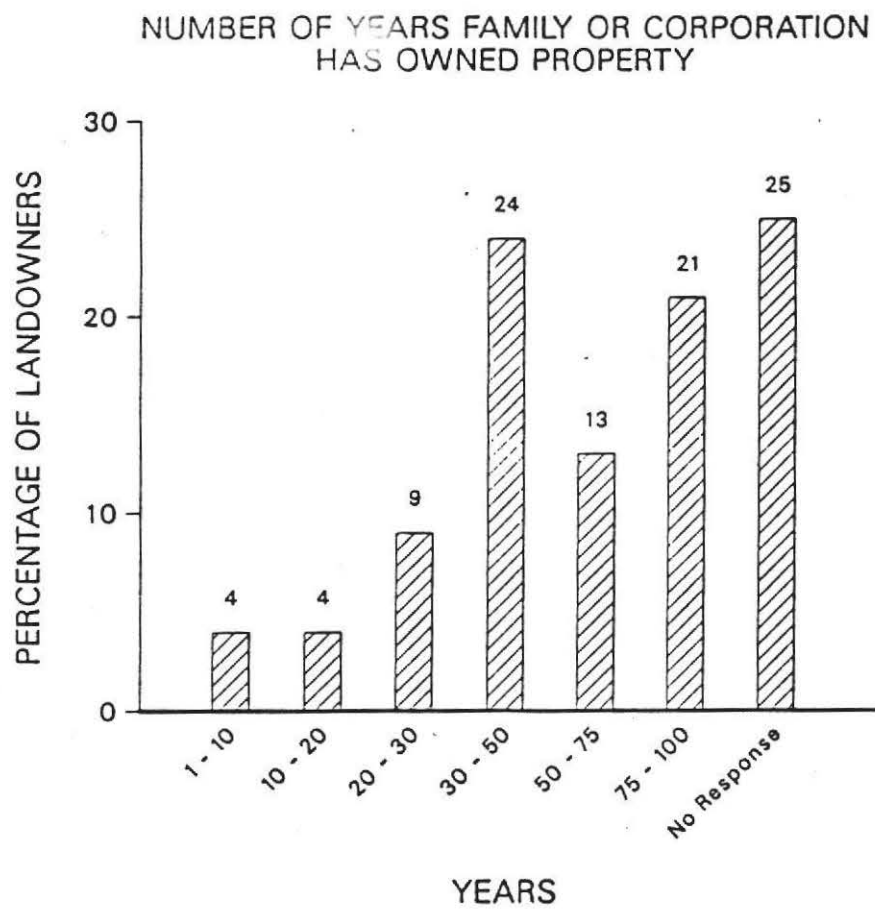


Fig. 8. Number of years family or corporation has owned property.

Years on Present Farm

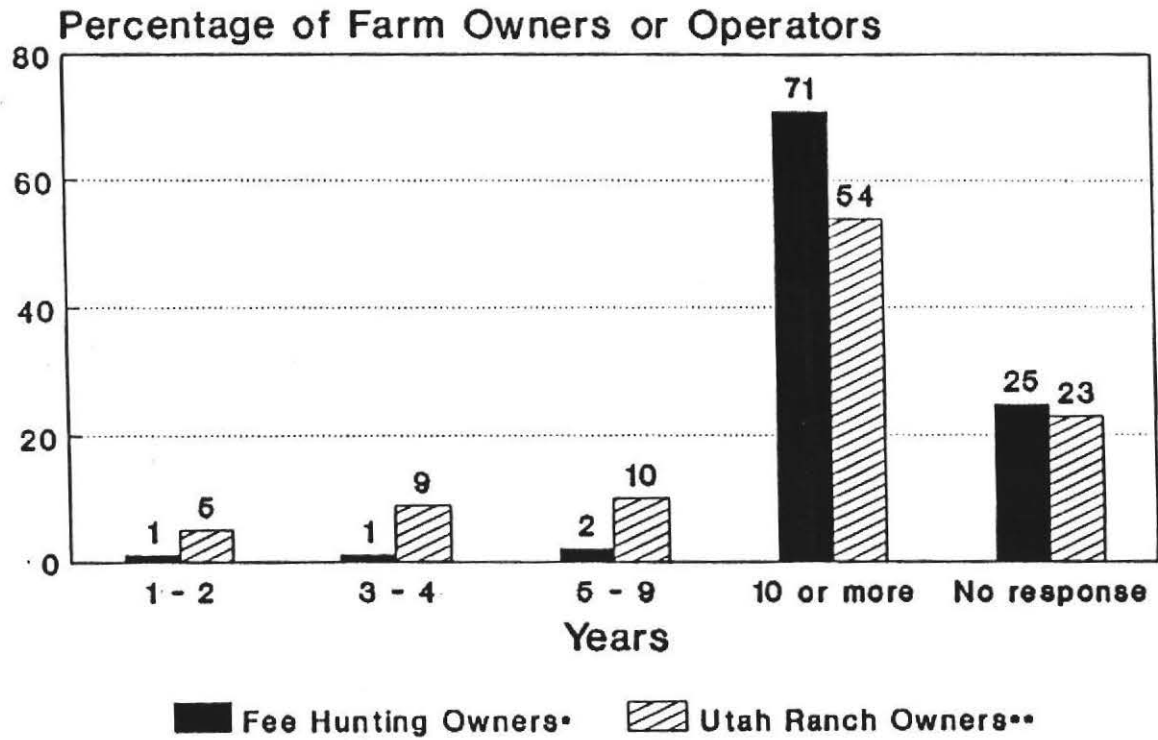


Fig. 9. Comparison of number of years on present farm.

Landowner or Operator Age

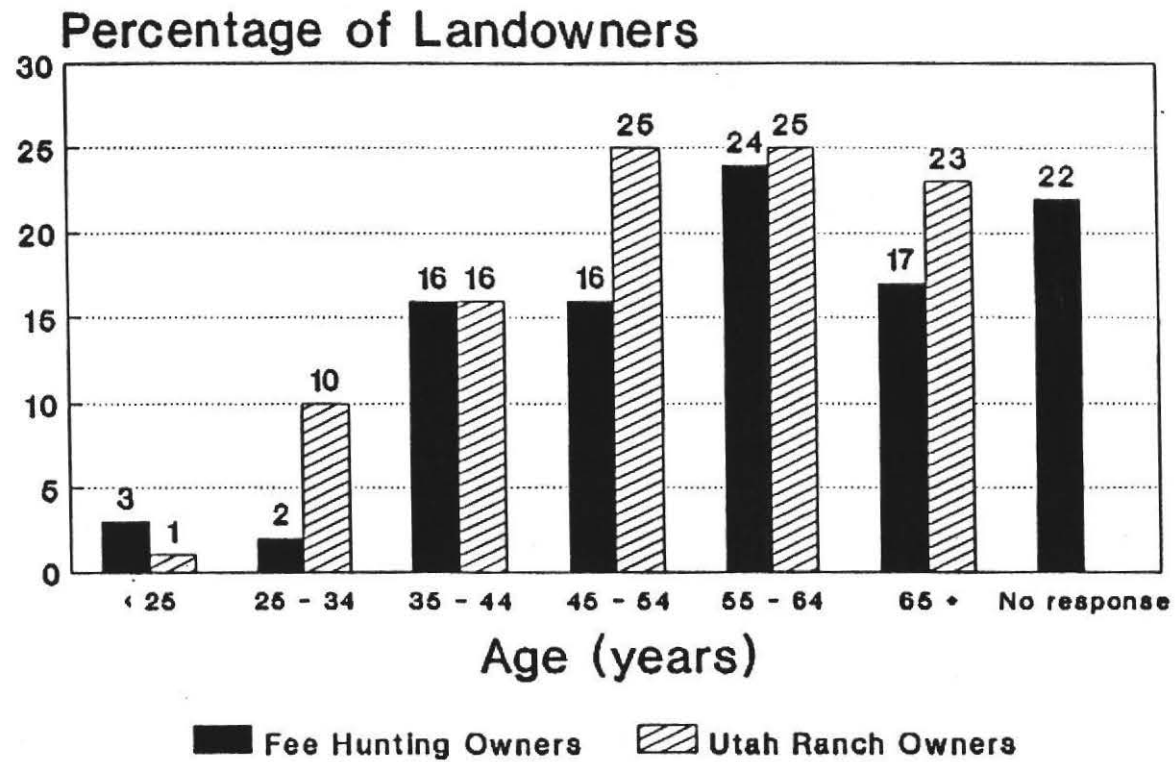


Fig. 10. Landowner of operator age categories.

6. Discussion of Agricultural Enterprise Characteristics

Agricultural enterprise and landowner demographic information was collected with the objective of identifying any characteristics unique to the fee hunting group. It is hoped that other landowners can compare their operations with those already engaged in fee hunting to see if there are enough similarities to warrant consideration of adding fee hunting to their management objectives.

Landowners engaged in fee hunting in Utah are typically livestock ranchers raising beef cattle or sheep or both. Many also raise crops, usually crops in support of the livestock operation such as alfalfa or meadow hay and improved pasture such as crested wheatgrass. Horses may be kept for pleasure or to help with livestock.

Fee hunting landowners own more acreage, have a larger breeding herd size, and have more land in crops than the average Utah livestock rancher. In addition, they have owned their property longer. Most have been raised in Utah.

Before conducting this research, I speculated that landowners who are involved in fee hunting had been raised in states with less public land or with a history of fee hunting such as Texas. It is clear from the demographic information that Utah fee hunting landowners are Utah natives and have owned their property for many years. Thus, fee hunting is generally not a phenomenon that is occurring because people

from other states are buying ranching property in Utah with the intention of using it for fee hunting. Instead fee hunting is an established tradition among native Utah landowners. This is corroborated by the fact that 73% of landowners have been charging a fee for at least 5 years, and 51% have been charging for at least 10 years.

Description of the Hunting Enterprise

The following section describes the extent of fee hunting in Utah and the economics, management, and organization of fee hunting enterprises. The description is quite detailed because it is hoped that this information will serve as a reference to others interested in fee hunting.

1. Land Area Involved in Fee Hunting

Total Land Area

There are 3,345,000 acres of privately owned crop, pasture, and rangeland in Utah (Soil Cons. Serv. 1987). Of this, 1,341,552 acres, or 40%, were available for fee hunting for deer and elk in 1986. Deer hunting was allowed on 1,238,952 acres, and elk hunting on 1,023,887 acres.

Fee hunting occurs in 20 of the 29 counties in Utah. Table 6 lists the number of acres available for fee hunting and the percent of privately owned non-urban land for each county. Privately owned non-urban land calculations are from the Utah Conservation Needs Inventory Report (1970) and are the most current data available.

Summit county has by far the largest number of acres available for fee hunting, followed by Rich and Morgan counties. Together, these three counties account for 57% of the acreage available for fee hunting. If Box Elder and Cache counties are included, the five counties account for 73% of the deer and elk fee hunting acres available in Utah.

Table 6. Number of acres available for deer and elk fee hunting and percent of privately owned non-urban land in each county.

<u>County</u>	<u>Acres</u>	<u>Percent of Private Non-urban</u>
<u>Land</u>		
Beaver	0	0
Box Elder	79,435	6
Cache	85,981	24
Carbon	73,767	19
Daggett	0	0
Davis	0	0
Duchesne	81,000	7
Emery	4,550	2
Garfield	2,320	2
Grand	7,070	4
Iron	0	0
Juab	0	0
Kane	3,200	2
Millard	0	0
Morgan	167,051	47
Piute	0	0
Rich	181,448	50
Salt Lake	0	0
San Juan	22,250	5
Sanpete	0	0
Sevier	34,000	14
Summit	408,260	64
Tooele	0	0
Uintah	6,200	2
Utah	31,883	5
Wasatch	61,500	24
Washington	3,000	1
Wayne	0	0
Weber	28,237	10

Figure 11 shows the approximate location of fee hunting land units in Utah. Landowners were asked to name the town nearest to the land on which they allow hunting. In Figure 11 black dots are placed near the town they named. Therefore, dots indicate the general location, but not the specific site where fee hunting is available.

From these data it is obvious that most of the deer and elk fee hunting in Utah takes place in the mountainous country of northern Utah, particularly Summit, Rich, and Morgan counties. As Figures 3 and 4 show, it is precisely these areas where most of the winter habitat required for present deer and elk populations occurs on private land. One possible explanation for the extent of fee hunting in northern Utah is that landowners in these areas are seeking compensation for providing deer and elk winter habitat and therefore are motivated to run fee hunting enterprises. Another possible explanation is that in these areas deer and elk are on private property during the hunting season. Northern Utah is the only area of the state where large proportions of mountain and foothill ranges are privately owned rather than being part of the National Forest system (see Figure 1).

Average Land Area per Landowner

The average number of acres per landowner available for fee hunting is 11,768. Land size categories available for fee hunting are shown in Figure 5. Acres available for deer

hunting average 10,868 per landowner, and 8,981 acres for elk hunting. There were many examples where landowners with small acreages grouped together or joined with adjacent large landowners to offer fee hunting (this was especially prevalent in northern Utah, and is one reason why Figure 11 shows such a proliferation of black dots in northern Utah).

2. Economics of Fee Hunting

Fees Charged

Trespass fees in Utah vary. Factors which may influence fees include amount and quality of land, number, type, and quality of animal, type and length of hunting seasons, responsibilities of hunters, and services provided by landowners or outfitters. Examples of some average fees for deer, elk, or combination deer and elk hunting opportunities are shown in Figure 12. There is a large difference in fees for guided versus unguided hunts. Morgan (1988) found that differences in hunt fees in New Mexico can be attributed to the various types of services offered with the hunt.

Note that season fees are not the amount paid by an individual hunter. Season leases are usually arranged by hunting clubs, groups of hunters, or outfitters who expect to market hunting opportunities to several hunters.

Combination deer and elk hunts are less expensive than separate deer or elk hunts in some cases because the motive for offering combination hunts is to minimize the time and

ELK FEES

	<u>\$/PERMIT</u>	<u>\$/ACRE</u>
GUIDED	2,133 (9)	1.00 (1)
UNGUIDED	71 (6)	—

DEER FEES

	<u>\$/PERMIT</u>	<u>\$/ACRE</u>	<u>\$/SEASON</u>
GUIDED	1,106 (14)	—	4,000 (1)
UNGUIDED	169 (41)	0.54 (6)	1,390 (10)

DEER & ELK COMBINATION FEES

	<u>\$/PERMIT</u>	<u>\$/ACRE</u>	<u>\$/SEASON</u>
GUIDED	900 (2)	1.00 (1)	10,667 (3)
UNGUIDED	81 (7)	0.62 (12)	2,016 (16)

Fig. 12. Average fees charged for various types of hunts.

effort spent dealing with hunters. These landowners charge only enough to accomplish the objectives of limiting and screening hunters. Unguided elk hunts are less expensive than unguided deer hunts because few landowners offer unguided elk hunts and several of those who do are primarily interested in controlling trespassing and therefore charge a very low fee. On the other hand, many landowners offer unguided deer hunts and fees range from quite high to low. As a result, the average fee for unguided deer hunts is lower than the average for unguided elk hunts.

Income

Average annual net cash fee hunting income, defined as total revenue less all annual operating expenses except depreciation and value of operator and family labor, was \$6587, or \$0.66 per acre. Opportunity costs of investments in land and facilities are not included in the calculations. Landowners usually attribute these latter costs to the livestock enterprise because they view their hunting enterprise as a sideline.

Figure 13 is a frequency distribution of net cash income. The largest group of landowners earned between \$1,000 and \$5,000. About 17% of landowners lost money on their fee hunting operations in 1986. A review of the responses of the eight landowners who had a negative annual net cash income of \$1000 or more revealed that the income loss could be explained

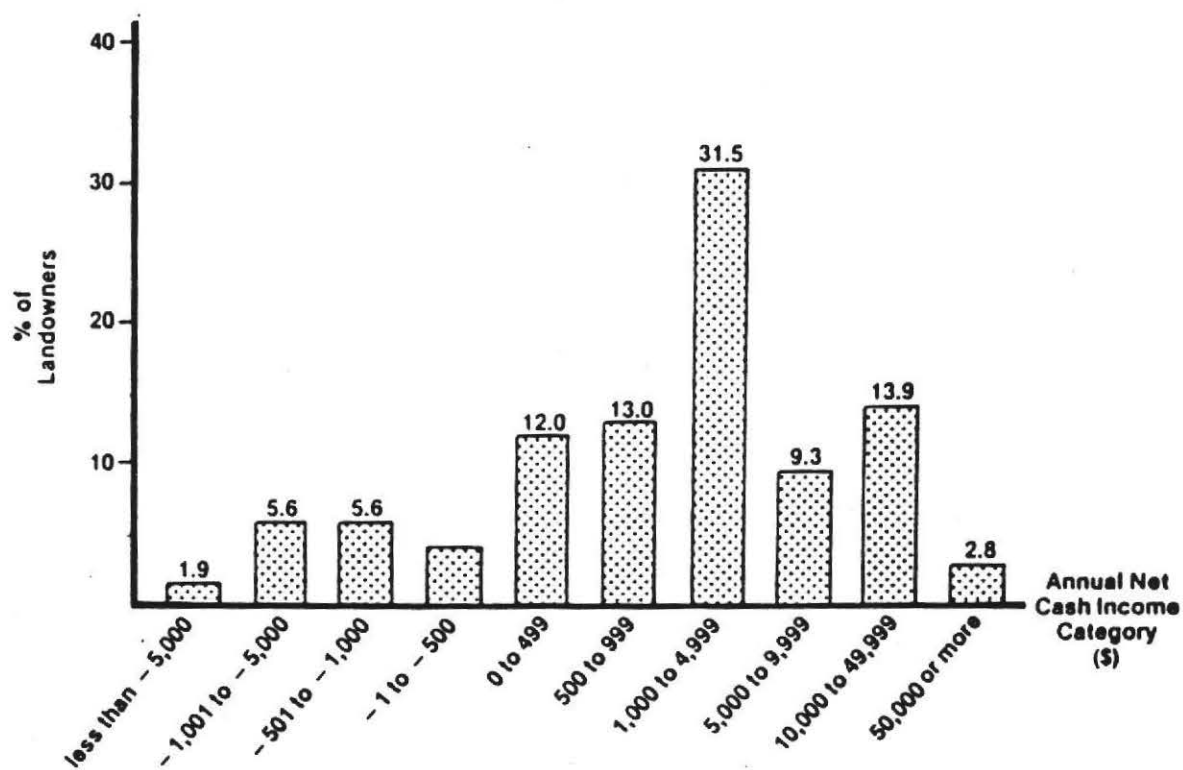


Fig. 13. Frequency distribution of annual net cash income from fee hunting.

by the following four phenomena: (1) high costs of management changes to accommodate the hunting operation (for example, moving livestock early and therefore having to purchase alternative forage), (2) high costs of having wildlife or hunters (crop depredation, fence and road repair), (3) charging a very minimal fee (\$10 to \$25 or an exchange of labor) for permission to hunt, or (4) operating a planned unit development or recreational ranch in which other parts of the enterprise are apparently subsidizing the hunting operation.

Recall that annual net cash income was calculated without including the cost of operator labor time. However, the opportunity cost of operator labor equals zero only when the operator could not be doing any other productive work during the time spent managing the fee hunting enterprise. Clearly, this is not the case for livestock ranchers during the fall of the year. Therefore, it is appropriate to value that labor time, but what that value should be, and if it should be the same for all operators, is uncertain. For example, some landowners are sole proprietors and do all the management themselves. Others work in other professions and manage their property on the side or only during the hunting season. Still others negotiate with a club or outfitter and do not do any additional management. On the other hand, many landowners stated that they would have to be out on the property managing hunters whether they were involved in fee hunting or not. In

that case, the opportunity cost of labor time spent managing fee hunting would equal zero.

Most landowners stated that income from the hunting operation accounted for less than 10% of their gross ranch income (Figure 14). Morgan (1988) reports similar results for New Mexico. On the other hand, Gynn and Steinbach (1987) state that in Texas income from leasing hunting and fishing privileges often exceeds income from livestock.

Major Expenses

Many landowners have arrangements whereby hunters or outfitters are responsible for annual expenses associated with guiding, meals, preventing trespassing, and road and facility maintenance. Figure 15 shows the number of landowners who pay certain expenses themselves and what those expense categories are. The most common expenses are those associated with vehicle use, road and facility maintenance (facilities includes fences and gates as well as facilities used by hunters such as campsites, cabins, culinary water, electrical hookups, etc.), preventing trespassing, and office supplies. Morgan (1988) reports that the most common expenses for New Mexico landowners involved in fee hunting are additional mileage on vehicles, maintenance on roads and fences, and labor hours.

Figure 16 shows the average expense per landowner for landowners who pay their own expenses. Note that most of the

Percent of Gross Ranch Income Contributed by Revenue from Fee Hunting

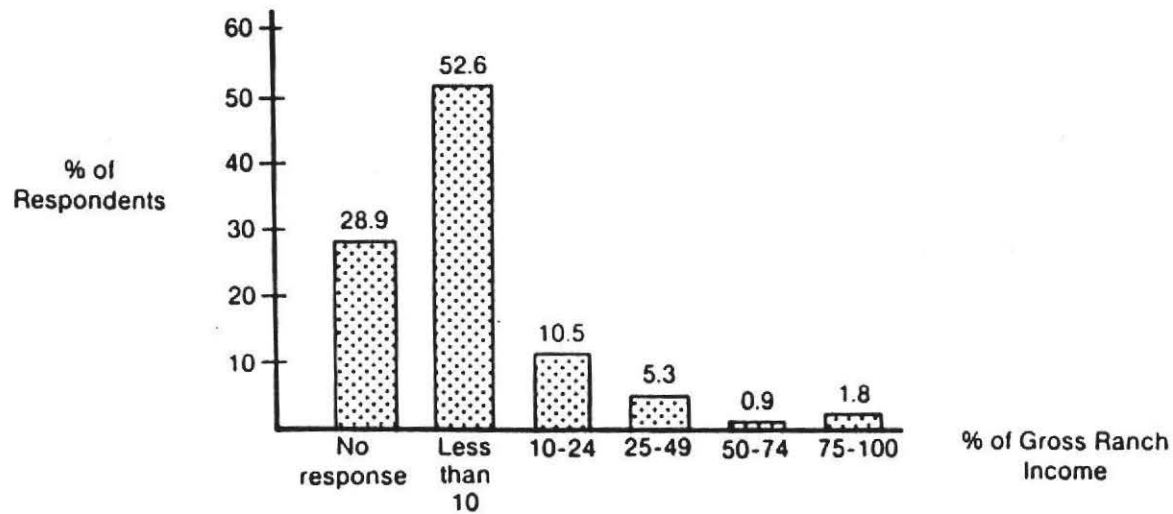


Fig. 14. Percentage of gross ranch income contributed by income from fee hunting.

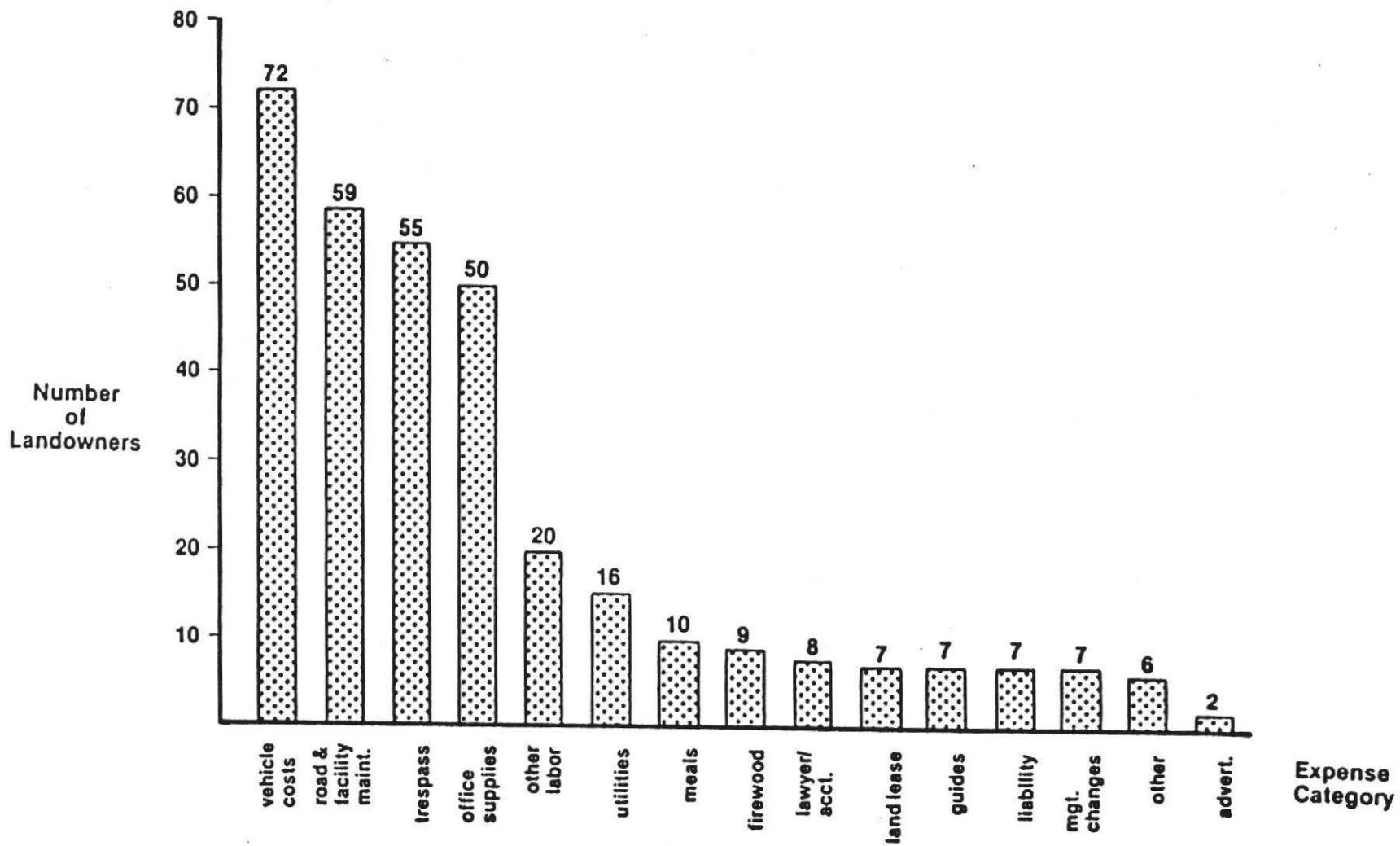


Fig. 15. Expense categories for fee hunting landowners.

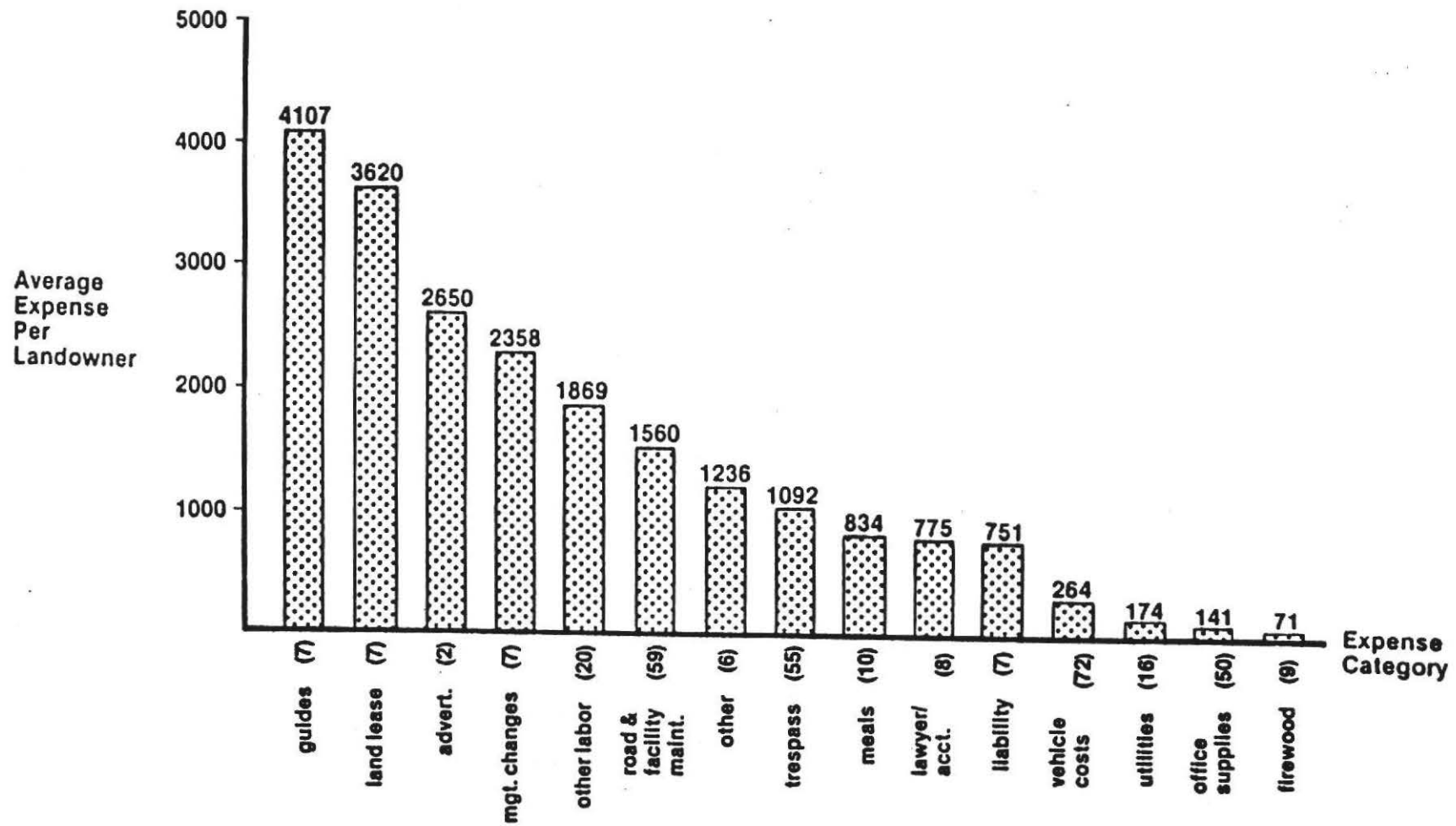


Fig. 16. Average expenses for fee hunting landowners. Number in parentheses is the number of landowners who have expenses in each category.

higher expenses are those associated with providing a full-service guided hunt and are incurred by very few landowners. A common high expense is road and facility maintenance.

3. Management of the Hunting Enterprise

Length of Time Fee Hunting Has Been Occurring in Utah

Fee hunting is not new in Utah. As Figure 17 shows, seventy-three percent of the landowners have been charging a fee for at least 5 years, and 51% have been charging a fee for at least 10 years. Morgan (1988) reports that in New Mexico, 90% of fee hunting enterprises are less than 20 years old (compared to 77% in Utah), and 75% are less than 10 years old (compared to 49% in Utah). During the survey, many landowners were encountered who had charged in the past but did not charge in 1986, or who had not yet charged but were planning to soon. Thus, although on the average there may be the same number of landowners involved in fee hunting each year, the actual membership may vary.

Residency of Fee Paying Hunters

One of the frequently heard criticisms of fee hunting is that resident hunters are discriminated against because of the high fees charged. In this survey, landowners were asked to estimate the percentages of their hunters who are residents and non-residents. As shown in Figure 18, 44% of landowners indicated that between 90 and 100% of their hunters are

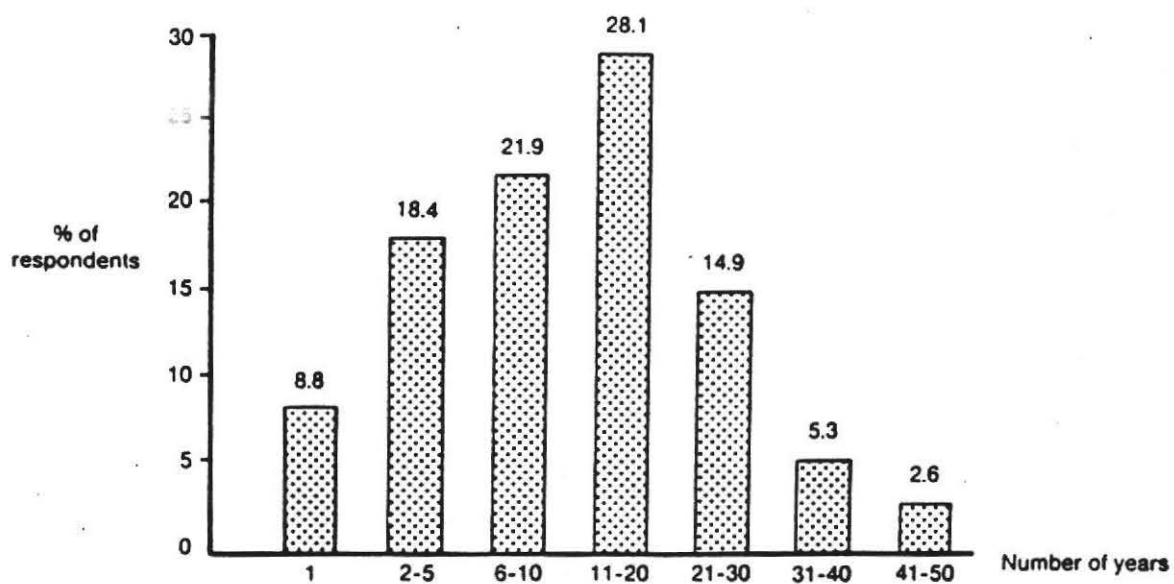


Fig. 17. Number of years landowner have been charging for deer and elk hunting on their property.

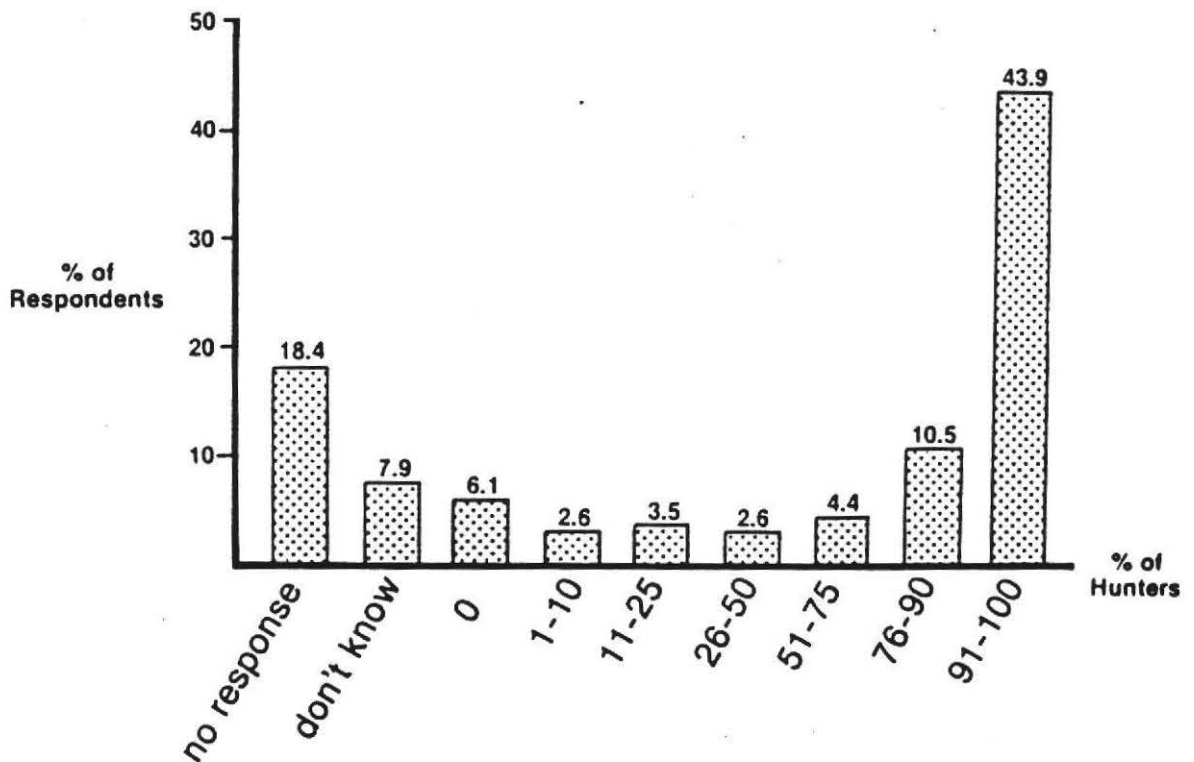


Fig. 18. Percent of hunters who are Utah residents.

residents. Only 15% of landowners indicated that less than half of their hunters are residents. These results show that residents are participating in Utah fee hunting. This is consistent with the fact that half of the landowners lease their land to hunting clubs, whose memberships are typically local.

Family and Owner Involvement

The average time landowners spend running their fee hunting enterprise is 65 hours, or a little over 8 days (assuming 8 working hours per day)¹. Figure 19 is a frequency distribution of the amount of time landowners spend managing their fee hunting enterprise. Two-thirds of landowners spend 5 days or less on fee hunting management. Twenty-four percent of landowners indicated that their family helps run the hunting enterprise.

Liability Insurance

Only 25% of landowners require hunters to sign a waiver of liability, and only 11% purchase extra liability insurance. Some landowners indicated that the liability insurance they normally carry for the ranch would also cover hunters, or that the hunting club or outfitter carried liability insurance therefore making it unnecessary for the landowner to purchase

¹Workman (1986) suggests that 3750 hours per year, or a little over 10 hours per day, 7 days per week, is an appropriate figure for the amount of time farmers and ranchers spend managing their agricultural enterprises.

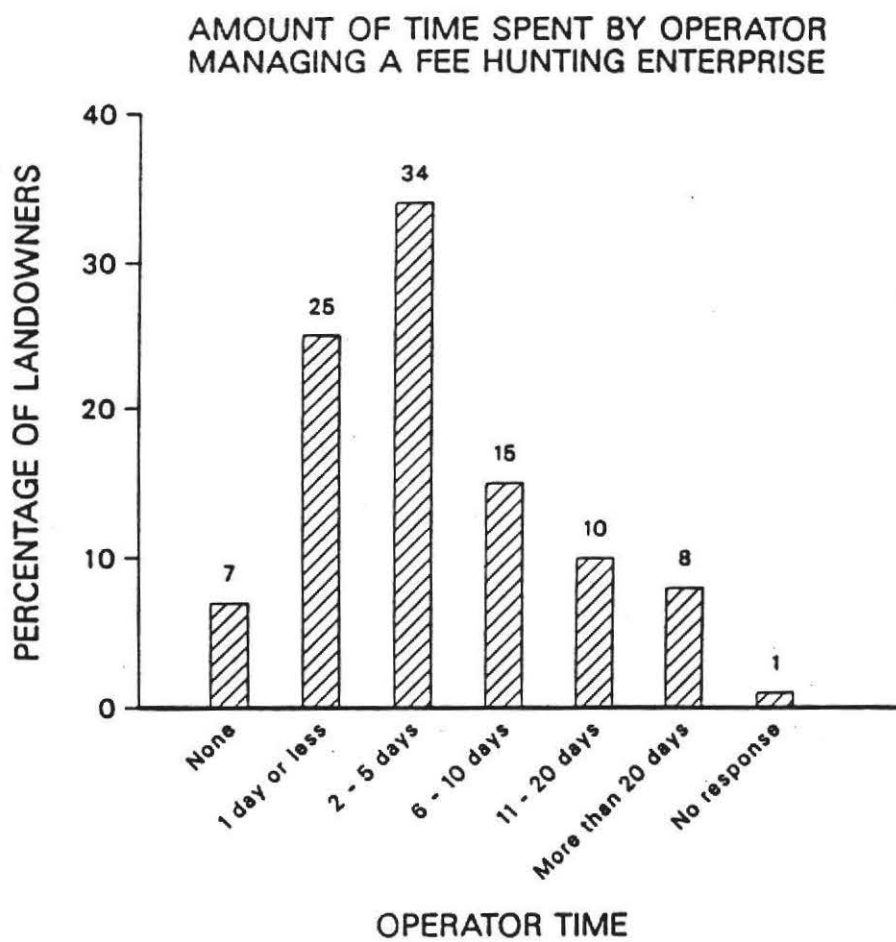


Fig. 19. Amount of time spent by operator managing a fee hunting enterprise.

it. Morgan (1988) cites similar figures and opinions for landowners in New Mexico. Utah landowners may be naive about the consequences of inadequate liability insurance, but no landowners mentioned having had a liability problem. Nationwide, state wildlife management agencies are not aware of any liability suits relating to fee hunting (Wiggers and Rootes, 1987). Liability is often cited as the major impediment to provision of recreation opportunities on private land (Church 1979, Horvath 1986).

Investments in the Hunting Enterprise

One-fourth of fee hunting landowners have made investments in the fee hunting enterprise over the years. Table 7 shows the types of investments made. Percentages add up to more than 100% because many landowners made more than one type of investment.

Most of the investments were made to improve facilities for hunters (cabins, utilities, meathouse) or to improve hunter and wildlife management (fences, gates, roads). However, a few landowners had made range improvements for wildlife such as seedings or wetland development. Pond development was undertaken to develop fishing opportunities. Wetlands and pond development are treated as investments in the hunting enterprise because fishing is sometimes included in the hunting permit and because property managed for wildlife health and diversity contributes to the aesthetic

Table 7. Investments made by landowners in their fee hunting enterprises.

<u>Type of Investment</u>	<u>Percentage</u>
Build or improve cabins, lodges, or other accommodations for hunters	34
Build or improve roads	31
Build or improve fences and gates	28
Utility development (culinary water, electricity)	21
Range improvements/wetlands or pond development	17
Legal services (establish rights of way, trespassing)	10
Campsite development	10
Vehicle purchase	10
Build meathouse	3
Build hunting blinds	3

quality of the hunting experience, and often these investments were explicitly made for that purpose.

Several landowners mentioned that they required legal services to draw up contracts, prove a right of way, verify property lines, or help prosecute trespassers. These expenses have been treated as investments because the rights they established are necessary to the future success of the fee hunting enterprise.

Changes to Accommodate Fee Hunting

Landowners were asked what changes they had made in the management of their agricultural enterprise to accommodate a fee hunting enterprise. More than half (54%) indicated that they had made no management changes. Often they stated that, since they had always had hunters and wildlife on their property, their management practices had evolved to take them into consideration. Twenty-three percent indicated that they had to move animals to a different location because of hunting activity, six percent changed their grazing management, and four percent restricted other recreation when hunting was occurring.

Land Use

In order to get an idea about what kind of land is involved in fee hunting and how it is integrated into the overall management objectives for the property, landowners were asked how the land that was hunted on was used at other times of the year. Table 8 shows their responses.

Clearly, it is privately owned grazing land that is used for fee hunting, as well as some hay fields. Other recreational activities include snowmobiling, horseback riding, picnicking, and camping.

Wildlife Management Practices

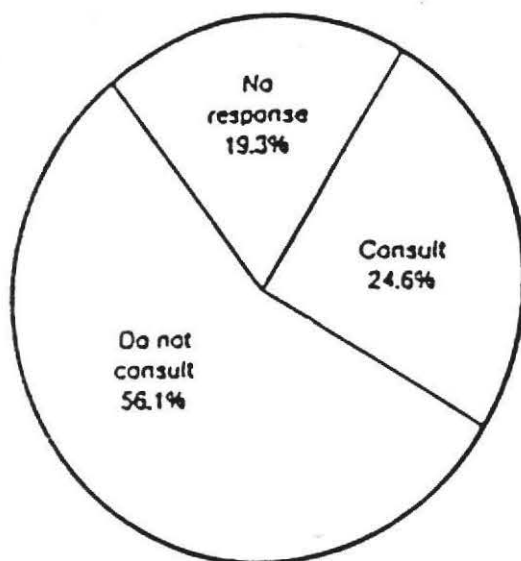
Most landowners do not actively manage the wildlife on their property. For example, only 19% of landowners indicated

 Table 8. Use of hunted land at other times of the year.

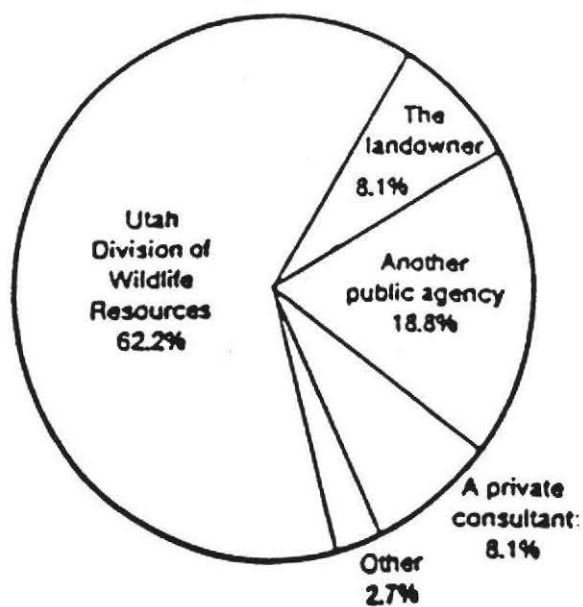
<u>Land Use</u>	<u>Percentage</u>
Cattle grazing	60
Sheep grazing	46
Other recreation besides hunting	23
Crop (hay)	18
Other	1
None	1
No response	18

that they census deer or elk. Twenty-five percent have consulted with a wildlife biologist, and the wildlife biologist they consulted was usually an employee of the Utah Division of Wildlife Resources (Figures 20a and 20b). This contrasts with the impressions of state wildlife management agencies nationwide, only 12 of which report that state wildlife biologists are consulted by landowners or hunters making management decisions on leased hunting land (Wiggers and Rootes 1987).

Although landowners were aware that their grazing management and range improvements for livestock also benefit wildlife, most landowners have not initiated habitat improvements specifically for deer and elk. As shown in



20a.



20b.

Fig. 20(a) Percentage of landowners who have consulted with a wildlife biologist, (b) Employment of biologist landowners consulted.

Figures 21a and 21b, only 19% of landowners indicated that they had ever improved their land to benefit deer or elk, and only 10% improve habitat annually. Table 9 shows the types of improvements they make.

Table 9. Habitat improvements made by fee hunting landowners.

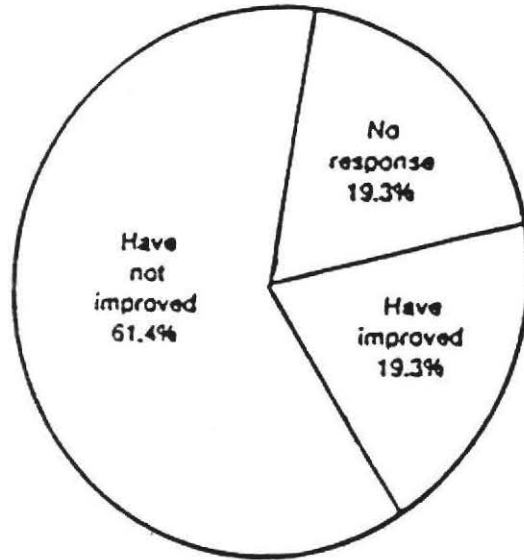
<u>Type of habitat improvement</u>	<u>Percentage</u>
Seedings	44
Reduce or exclude livestock	44
Brush or tree removal	32
Water development	28
Let down fences	12
Other	12

Fee hunting landowners have deer on their property most of the year (average of 11 months) and elk 7.5 months of the year. A few landowners (11%) feed deer, usually with meadow hay or deer pellets, and even fewer landowners feed elk (4%) with meadow hay, alfalfa hay, or pellets from the Division of Wildlife Resources.

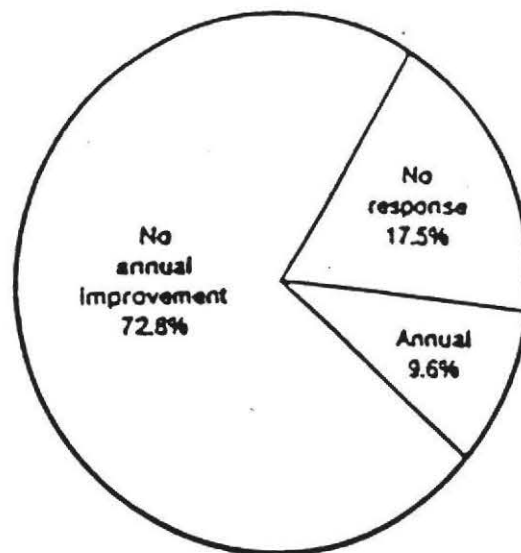
Hunting Enterprise Organization

A. Seasons and Animals Available for Fee Hunting

Hunting enterprise characteristics are very complex to describe because each landowner manages at least some things



21a.



21b.

Fig. 21(a) Percentage of landowners who have made wildlife habitat improvements, (b) Percentage of landowners who make habitat improvement annually.

differently from other landowners. Typically, trespass permits or leases are issued for the deer season only, the elk season only, or for both deer and elk hunting seasons. Usually a permit or lease covers the general deer and elk seasons although there are a few instances where other seasons such as archery or antlerless hunts are under a permit or lease arrangement. Figure 22 shows the proportion of landowners who provide hunting opportunities for the different deer and elk seasons available in Utah. Since deer and elk seasons are set by the Utah Division of Wildlife Resources and vary from area to area, not all landowners are able to offer hunting opportunities for each season.

Some leases or permits include permission to hunt other animals, either during the deer and elk seasons if legal, or at other times of the year. Table 10 shows the percentage of hunts that offer opportunities to hunt other animals. Percentages add up to more than 100 because sometimes more than one additional opportunity is offered.

B. Hunter Management

One-fourth of landowners did not know how many hunters hunted on their property during the time the trespass permit covered. This is because when landowners lease to a club or outfitter, often it is the club or outfitter who decides how many and which hunters will be offered the hunting opportunity. Adding up the total number of hunters served by

Percentage of Landowners Who Offer Opportunities for Various Deer and Elk Seasons

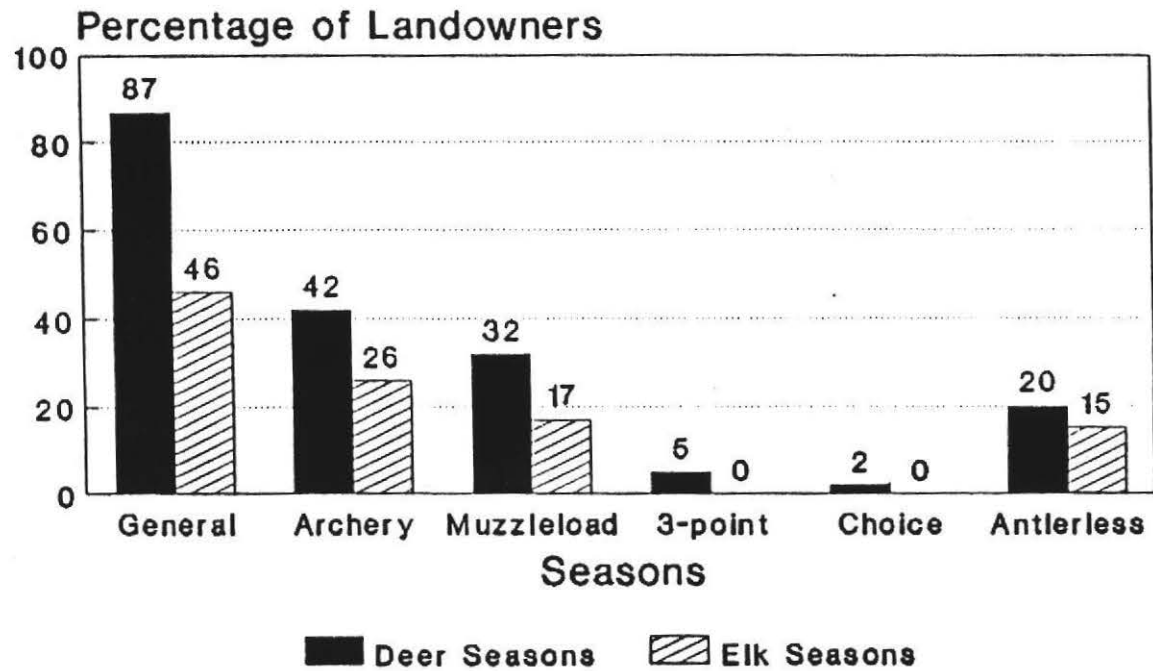


Fig. 22. Percentage of landowners who offer opportunities for various deer and elk seasons.

Table 10. Percentage of hunts that include opportunities to hunt other animals as part of the deer or elk trespass fee.

<u>Other Animals Included in Fee</u>	<u>Percentage</u>
None	60
Fishing	21
Small Game	13
Moose	11
Predators	9
Bear	3

those landowners who knew how many hunters used their property gives a total of 6260 hunters, or an average of 73 hunters per landowner. Figure 23 shows a frequency distribution of total number of hunters served in 1986. About half (48%) of landowners provided hunting opportunities for 50 or fewer hunters.

Sixty-five percent of landowners indicated that they limit the number of hunters that are allowed on their property at one time. Some landowners (20%) did not know if the number of hunters was limited because that was left to the discretion of the club they leased their land to.

Figure 24 shows a frequency distribution of the number of hunters allowed on the property at one time. The average

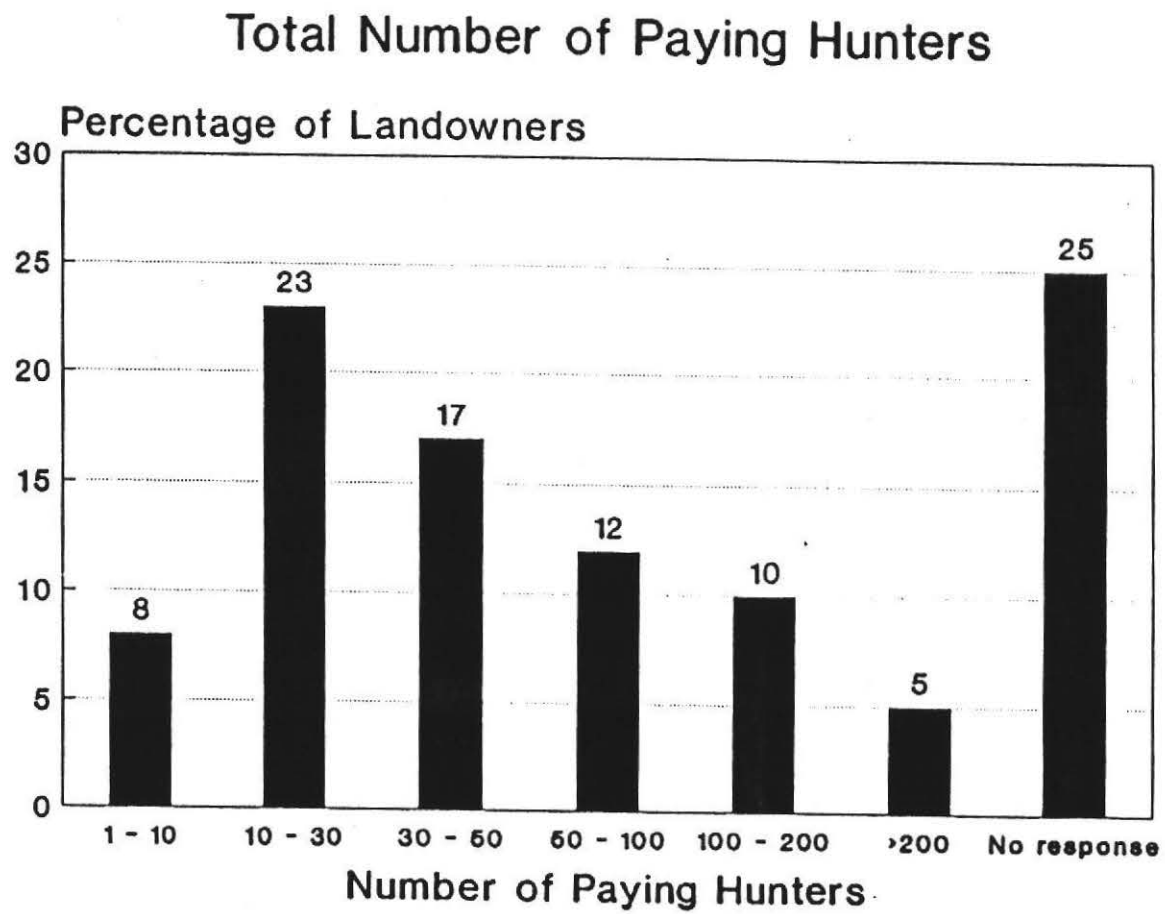


Fig. 23. Total number of paying hunters.

Number of Paying Hunters Allowed on the Property at One Time

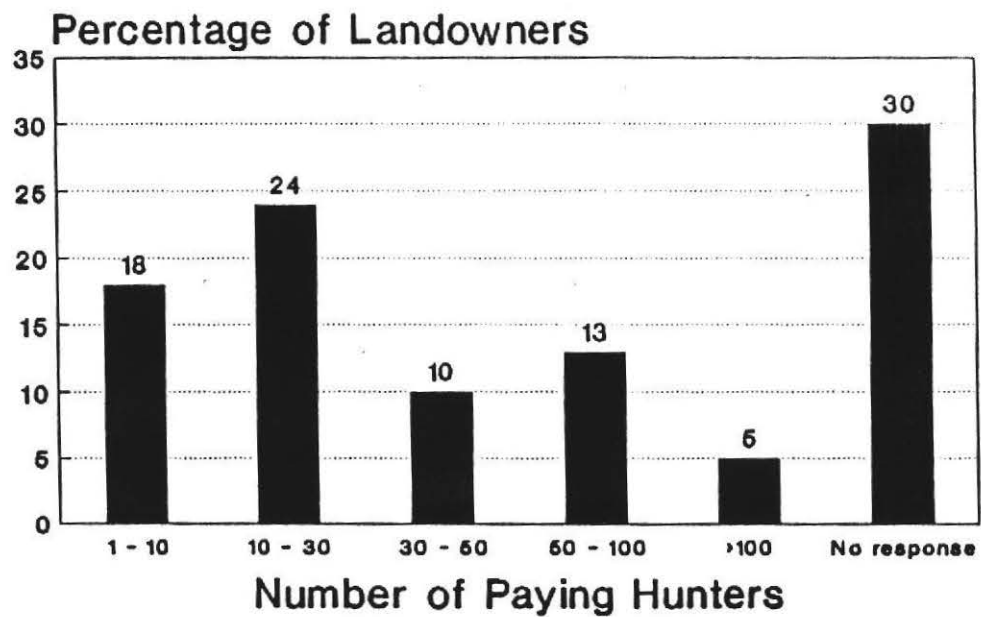


Fig. 24. Number of paying hunters allowed on the property at one time.

number of hunters on the property at one time is 43. Remember that many landowners did not know how many hunters were on their property either during the season or at one time.

Figure 25 shows a frequency distribution of the number of acres available per hunter on fee hunting enterprises. This number was calculated by dividing the number of acres available for hunting by the number of hunters allowed on the property at one time. Fifty-four percent of landowners offer 500 or less acres per hunter. The average number of acres is 394.

C. Method of Charging

About half the landowners sell trespass permits directly to individual hunters and half lease their land to hunting clubs or outfitters. Sometimes a landowner sells trespass permits to an outfitter who in turn issues them to hunters.

D. Hunter Restrictions and Responsibilities

Except when permits are sold to an outfitter, a permit system implies that the landowner is running the hunting enterprise himself. In this case, the landowner usually expects to guard gates, post the property, and patrol for trespassers (although hunters are always expected to report trespassers). In addition, the landowner expects to bear the costs of any damages caused by hunters. Since hunters are often directly supervised either by the landowner or outfitter under a permit system, it is not necessary to specify many

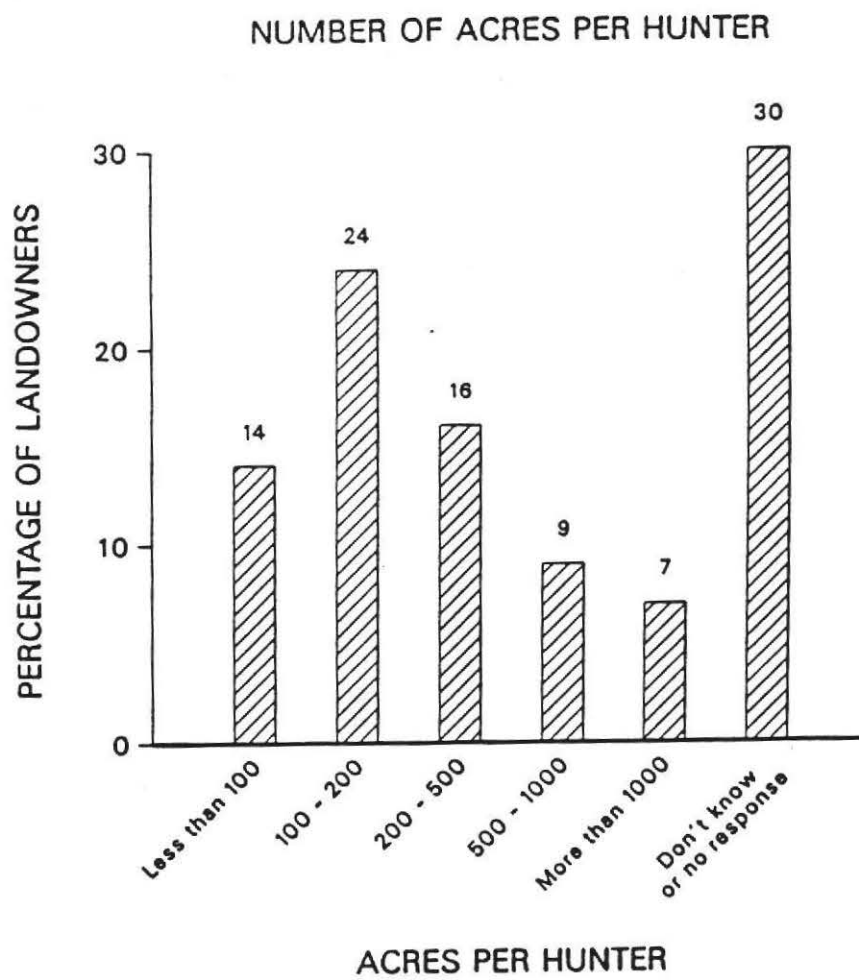


Fig. 25. Number of acres per hunter.

restrictions. One restriction that is specified by about one-third of landowners is use of alcohol during the hunt. Some landowners prohibit alcohol use altogether, others prohibit alcohol use only during daylight hours.

Under a lease system, in contrast, hunters are often expected to post the property, guard gates, and patrol for trespassers. In addition, they may also be expected to repair any damages caused by themselves or any trespassing hunters. Since hunters under a lease system generally are not directly supervised by the landowner, landowners often specify areas where camping is allowed.

About two-thirds of the landowners specify road or vehicle restrictions for both lease and permit systems. Another commonly cited concern is litter. Figure 26 compares the restrictions and expectations of paying hunters by method of charging.

E. Services Provided to Hunters

Eleven percent of landowners offer no services to their hunters, 77% offer between one and five services, and 12% offer more than five services. In New Mexico, most landowners do not offer any services with their hunts (Morgan 1988). Figure 27 compares the services provided by landowners who offer 1-5 services with those provided by landowners who offer more than 5 services. When less than five services are offered, the services are typically a campsite, water if

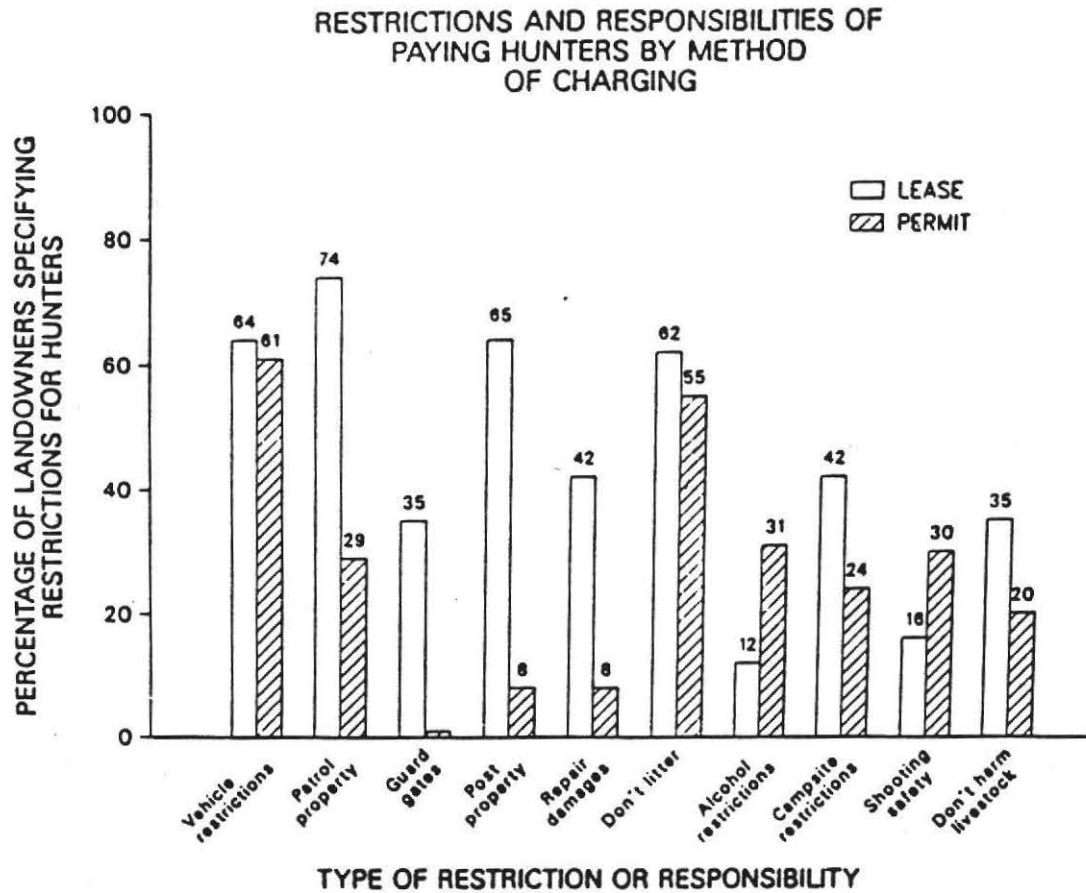


Fig. 26. Restrictions and responsibilities of paying hunters by method of charging.

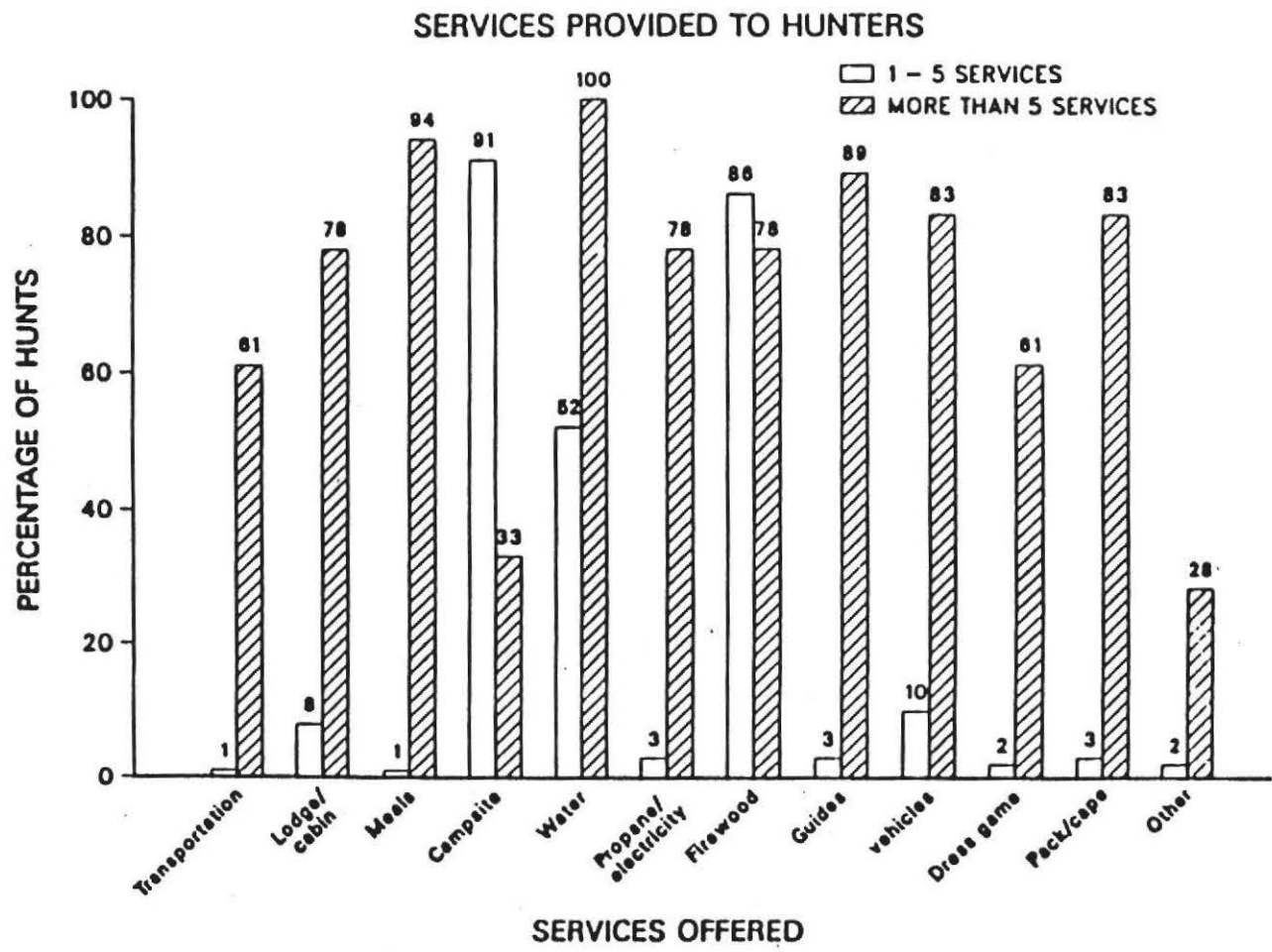


Fig. 27. Services provided to hunters.

available, and firewood. When more than 5 services are offered, the hunt is usually full service offering transportation to the property, guides, lodging, meals, water, firewood, vehicles or horses, and help with dressing and packing game.

Figure 28 summarizes the relationship between number of services and hunt type. Hunt type is delineated by animal to be hunted, method of charging, and whether hunt is guided or unguided. Note that most hunts are of the no service or 1-5 service types regardless of the animal to be hunted. However, 30% of the elk hunts are of the full service type compared to only 13% of the deer hunts. Most of the lease hunts offer few services, whereas 20% of the permit hunts offer full services. None of the unguided hunts offer more than 5 services, whereas guided hunts always offer some services and more than half are of the full service type. The average number of services offered with guided hunts is 6, and for unguided hunts 2.

4. Landowner Opinions and Impressions about Running a Fee Hunting Enterprise

Why Landowners Initiated Fee Hunting

Fee hunting is often viewed as a means for landowners to receive compensation for the forage and habitat they provide for wildlife. Consequently, it has been assumed that compensation for costs associated with the presence of wildlife is a major reason why landowners initiate fee

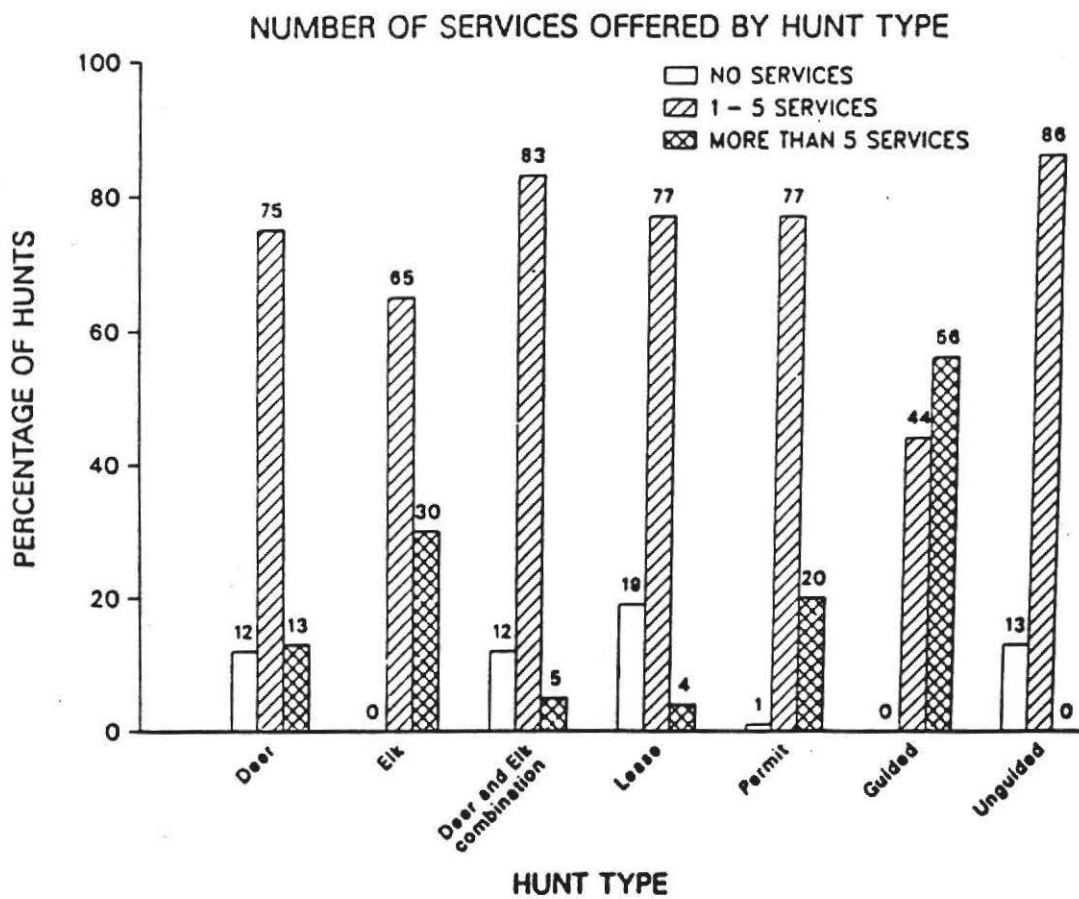


Fig. 28. Number of services offered by hunt type.

hunting. Conversations with landowners as part of this survey indicate that this is not necessarily the most important motivation for fee hunting. Table 11 shows landowners reasons for initiating fee hunting.

Table 11. Why landowners initiated fee hunting.

<u>Reason</u>	<u>Percentage</u>
Trespass control	36
Profit, or to cover hunter costs	26
To cover costs of wildlife depredation	6
Other or don't know	39

Trespass control emerges as the most important reason for initiating fee hunting. Landowners repeatedly reported terrible problems with trespassers. They indicated that they had tried closing off all their land to hunters, or had opened up their land as a good-will gesture, in order to try to decrease the trespassing problem. Neither approach had worked. As a result, they tried fee hunting. They stated that fee hunting allows them to screen hunters, specify desired behavior, and get help patrolling because paying hunters have an incentive to keep non-paying hunters out. Thus, fee hunting is viewed as a means of minimizing damages caused by trespassing hunters and gaining management control over their

land. Similar results have been reported by Gynn and Schmidt (1984), Wright and Kaiser (1986), and Knight et al., (1987).

In addition, of course, fee hunting allows landowners to obtain revenue to offset expenses associated with either paying or trespassing hunters. This additional revenue was the second most important reason listed by landowners for initiating fee hunting. Some landowners viewed this income as compensation for hunter costs and some viewed it as an additional profit opportunity not associated with compensation for hunter or wildlife costs. It was necessary to lump these two reasons into one category because many landowners mentioned both profit and compensation as a motivation and it was not possible to differentiate which motivation came first or was most important.

A significant number of landowners did not know why fee hunting had been initiated because it had been started by their parents or grandparents.

What Landowners Offer Hunters

Landowners were asked what they think is the most unique or special opportunity they offer that makes hunters willing to pay to hunt on their property. Table 12 shows their responses. Numbers add up to more than 100% because often landowners gave more than one response.

Most landowners (58%) stated that they offer the opportunity to hunt with fewer hunters under less crowded

Table 12. Opportunities landowners think they provide to hunters.

<u>Opportunity</u>	<u>Percent</u>
Limited hunters	58
Good hunting	45
Accessible land and animals	19
Plenty of land / beautiful land	15
Services	10
Trophies	6
Other	4

conditions. Many landowners (45%) stated that they offer good hunting, either because they have more or better quality animals on their land than is available on public land, or because hunters have a better chance of getting an animal because there are less hunters relative to the number of game animals and land area available for hunting. Other important opportunities landowners think they offer hunters include accessible land and animals (either close to urban areas or well-roaded), and plenty of land or (in their words) very beautiful land to hunt on. Note that relatively few landowners (6%) stated that providing a trophy hunting opportunity is one of the major reasons hunters are willing to pay to hunt on

their property.

How Landowners Decided
What to Charge

Economists predict that the rational manager sets prices so as to cover all expenses including a desired return on investment and operator time. The manager then determines if the demand for the product and the supply of similar or substitute products are such the product can be sold in sufficient quantity at the price which has been determined. If not, the manager must find a way to lower costs, change the product, or increase demand.

There has been very little research into the supply and demand for fee hunting recreation, and none recently in Utah. Therefore, to learn about landowner management strategies and perceptions of supply and demand, landowners were asked how they decided what to charge. Table 13 shows their responses. Many landowners gave two responses, therefore percentages add up to more than 100%.

Many critics accuse fee hunting landowners of being primarily interested in gouging a profit from a publicly owned resource (wildlife). However, these results show that only 22% of responses indicate a clear profit motive (charge what the market would bear or what hunters would pay). Other concerns of landowners in setting fees are covering costs (14%), controlling hunters (19%), and being fair (19%). The largest group of landowners simply base fees on what other are

 Table 13. How landowners decided what to charge.

<u>How Landowners Decided What To Charge</u>	<u>Percentage</u>
Based on what others were charging	27
Club or hunters made an offer	22
Charge what the market would bear, what hunters would pay	22
Charge what I thought was fair	19
Charge what was necessary to control hunters	19
Charge enough to cover expenses incurred by having hunters and wildlife on property	14
System evolved, started low and gradually was adjusted to current fee level	11
No response	5

charging (27%) or accept what hunters or the club offers (22%).

Thus, it appears that some landowners let demand set their fee (what club offered, etc.,) without taking into account supply or cost considerations, and some let supply or costs set their fee (cover hunter and wildlife costs) without being too concerned about demand. During the telephone interviews, no landowners indicated that they had any problem finding enough hunters. Therefore, supply currently appears to be below demand in Utah. Given that situation, an appropriate strategy for landowners would be to calculate

their costs and set fees to cover all their costs including a return on investment and operator time. Since 17% of landowners are losing money on their hunting enterprises even without taking into consideration value of operator time or return on investment, it seems that some landowners are not paying enough attention to the costs of running a fee hunting operation.

Behavior of Paying Hunters

In general, landowners were pleased by the behavior of paying hunters and by fee hunting as a means of solving the problems of trespassing and hunter disrespect of property. However, 33% of landowners indicated that their paying hunters had upset them, usually by damaging property such as water tanks or gates (62%), damaging roads (41%), littering (15%), making an illegal kill (10%), trespassing into areas which were not part of the agreement or onto neighboring property (8%), and shooting carelessly (5%).

Problems with Starting and Running a Fee Hunting Enterprise

Landowners were asked what problems they encountered in initiating or running a fee hunting enterprise. As shown in Table 14, the most frequently mentioned problems were property and road damage and trespassing. Since landowners often initiated fee hunting in order to try to eliminate exactly these problems, it is unfortunate that they remain.

Table 14. Problems encountered by landowners in initiating or running a fee hunting enterprise.

Problems In Starting & Running

<u>A Fee Hunting Enterprise</u>	<u>Percentage</u>
Trespassing	30
Property/road damage	30
None	9
Other	5
Politics/legal difficulties	4
Get enough hunters	4
Conflicts with grazing	4
Weather	4
Coyotes	1
No response	35

Nevertheless, landowners did indicate that these problems had been greatly reduced as a result of fee hunting. Presumably landowners are not aware of any method of eliminating these problems altogether, but instead must reduce them and live with what cannot be eliminated.

Note that 4% did mention getting enough hunters as a problem on the mail survey, yet during the telephone interviews none mentioned that they personally had ever had a problem getting enough hunters.

Advice to Other Landowners
Interested in Fee Hunting

Landowners were asked what advice or warnings they would give to landowners considering starting a fee hunting enterprise. Forty-six percent declined to offer advice. Table 15 shows the responses of those that did offer advice. The

Table 15. Advice or warnings for others considering initiating a fee hunting enterprise.

<u>Advice</u>	<u>Percentage</u>
Have good rules/liability	27
None	16
Screen hunters	13
Have things ready	13
Trouble with trespassers	11
Other	11
Lease to a club	10
Do it	5
Get paid in advance	2
Don't know	2

most frequent advice offered was to have good rules for hunters or have some way of dealing with potential liability problems, such as having hunters sign a waiver of liability

or by carrying liability insurance. Since only 25% of landowners require hunters to sign a waiver of liability, and only 11% purchase extra liability insurance, it seems that some landowners do not follow their own advice. Other important recommendations were to have everything ready and prepared for hunters beforehand, screen hunters, and expect trouble with trespassers. Morgan (1988) reports similar advice by fee hunting landowners in New Mexico about liability and having everything ready beforehand.

Desired Changes in Laws or Policies

Landowners were asked what changes in state or federal laws or policies would help their fee hunting enterprise the most. The changes most frequently mentioned by those who responded to this question were changes in game laws or seasons (58%) and changes in or enforcement of trespass laws (27%). Suggested changes in game laws and seasons are not enumerated here because there were nearly as many suggested changes as responses and many of the suggested changes were in opposition to one another. Landowners indicated that they do not think their views are adequately considered in decisions about game laws and seasons.

5. Discussion of Fee Hunting Enterprises

Fee hunting for deer and elk occurs on privately owned grazing land. This result is expected because fee hunting can only happen where deer or elk are on private land during the

hunting season. During October in Utah, deer and elk are moving from higher elevation mountain ranges to foothills, their exact location depending upon the extent of snowfall in the mountains. Mountain and foothill range is typically used for grazing because it is too dry, rocky, or steep for cultivated crops. Some foothill range is suitable for dry land alfalfa or native grass hay production, and this land is apparently used for fee hunting as well. Thus, only landowners who own mountain or foothill range can engage in fee hunting because this is where the deer and elk are during the hunting season. It is primarily in northern Utah where significant amounts of mountain and foothill ranges are privately owned and therefore where fee hunting is most prevalent.

Fee hunting is not a new phenomenon in Utah. It has been a part of some agricultural enterprises for many years, even for several generations. It appears to be an indigenous activity, conducted by resident managers rather than absentees and serving mostly resident hunters. In about one-fourth of cases, it is a family endeavor.

In general, landowners have made few changes in their agricultural enterprise management to accommodate fee hunting. Since fee hunting land is primarily used for grazing and recreation, management changes usually involve adjusting the grazing schedule so that livestock are not endangered by hunters and keeping other recreators out during the hunt.

Most Utah landowners stated that they initiated fee hunting primarily to obtain better control of their land. They reported having had extensive problems with trespassing, inadvertent property damage, deliberate vandalism, and littering by hunters and the general public. In addition, they have had problems controlling wildlife consumption of hay, crops such as alfalfa, and early spring forage. Many landowners had tried closing off all their land to the public, or opening all of their land as a goodwill gesture, but neither approach was effective in controlling trespassing or management problems. The solution which has seemed to work best is charging a minimal access fee. This allows landowners to screen how many and which hunters are allowed on the property, gives the landowner an opportunity to specify expectations of appropriate behavior, and provides help with patrolling and preventing trespassing. Paying hunters have an incentive to keep non-paying hunters out and to monitor their own behavior in order to retain their hunting privileges for next season.

Charging a fee also gives the landowner an extra tool for managing wildlife on his land. Landowners negotiate with their hunters to decide which areas to hunt and types of animals to harvest (for example, 3-point and better bucks), and by controlling the number of hunters, they can also control the number of animals harvested.

Landowners seemed generally pleased with their arrangements with hunters and hunting clubs. Many relationships were of long duration and had developed into deep friendships. Nevertheless, problems with trespassers remain.

Although most landowners initiated fee hunting in order to minimize problems resulting from the presence of hunters and trespassers on their property, they are not indifferent to the income they receive. Many stated that at least it paid the taxes on their land, or covered the costs of hunters. During low livestock income years, this supplemental cash income may be very important.

One of the most troublesome costs for landowners in Utah was road and facility maintenance (Figures 15 and 16). Facilities include such things as gates, fences, campsites, cabins, and lodges. Road and fence damage was the most frequent complaint against trespassers, and respect for roads and fences one of the most frequent requirements expected of paying hunters. The first heavy winter storms often occur during the deer and elk hunting seasons in Utah, and hunters may encounter muddy roads and snow. Since hunters have little choice about when they may hunt, they feel compelled to try to use roads regardless of conditions. As a result, roads get rutted or new roads are made to get around impassible areas. By the time hunting season ends, conditions are too wet or

snowy for road repair. Spring run-off causes additional erosion before roads dry up enough to allow repairs. Landowners stated that as a result of these problems they had to keep roads in better repair than had been necessary for their livestock operation. A common arrangement with hunting clubs was that the club was responsible for road and fence repair. For the 52% of landowners who did their own road and fence repair, the average annual expense was \$1560. Since landowners often owned the necessary equipment (i.e. tractors and grader blades) this was not necessarily a cash expense.

Another important expense mentioned by most landowners (63%) was vehicle costs. Landowners and other ranch hands do a lot of driving to check on property boundaries, campsites, and hunters.

Figure 12 shows a wide differential between fees charged for a guided versus an unguided hunt. Figure 16 gives some explanation of that differential. Most of the high expenses are those associated with providing the services expected of a guided hunt such as guides, additional leased land to maintain a high land to hunter ratio, advertising, changes in management of the livestock enterprise to accommodate wildlife and hunters, other labor such as cooks and packers, trespass prevention, and meals. Offering a fully guided and catered hunt is an expensive and complicated endeavor, necessitating an appropriate fee.

Many landowners recommended the lease system if a good club could be found to lease to. Leasing allows the landowner to delegate responsibility for any services and most costs associated with the hunt to the club or outfitter. All the landowner has to do is make a telephone call sometime during the summer to verify next year's arrangement, deposit the rent money, and check the property for damage and litter after the hunting season. Landowners stated that this was a good way to get started in fee hunting for landowners interested in trying it out.

Disadvantages of the lease system are that the landowner does not know which, or sometimes how many, hunters are on his property. Also, some hunter groups or clubs are not very responsible about living up to their agreements to pick up litter and repair damages. It may take a landowner several attempts before he finds a club that meets his specifications.

The permit system requires much more landowner time and effort. However, with a permit system, the landowner has more personal control over and familiarity with his hunters. This makes it easier to manage the hunting operation to meet certain objectives. For example, landowners who feel that they have the potential to offer trophy hunting may want to manage hunters and the harvest directly with a permit system in order to improve the size and number of trophy animals.

One of the benefits expected from fee hunting is

providing landowners with an incentive to use land and livestock management practices favorable to wildlife. Generally, this benefit is not yet realized in Utah. Landowners view their livestock enterprise as their central focus and the wildlife enterprise as a sideline. Land and livestock management practices are designed for livestock, not for wildlife. When investments and changes are made for the wildlife enterprise, they are made to facilitate hunter or trespasser management or provide better amenities for hunters. As previously mentioned, these results appear typical of fee hunting throughout the United States.

It appears that the landowner incentives under present fee hunting conditions are not adequate to promote wildlife enhancement efforts. Most landowners would rather be livestock ranchers, and they deal with hunters and wildlife only because they must to minimize costs.

Analysis of Relationships and Tests of Associated Hypotheses

In addition to the basic description of current fee hunting in Utah, this research project examined factors influencing net revenues from fee hunting and associated with willingness of landowners to make habitat improvements for deer and elk. Because income from fee hunting is viewed as an incentive to provide wildlife and hunter access to private land, it was deemed important to try to elucidate factors that influence net fee hunting income. Likewise, willingness to improve wildlife habitat is viewed as one potential benefit of landowner involvement in fee hunting. Understanding what factors are correlated with landowner willingness to invest in wildlife habitat improvements is necessary if policy makers or others interested in deer and elk populations wish to encourage wildlife habitat improvement activities.

1. Factors Affecting Net Fee Hunting Income

It was hypothesized that factors likely to influence net fee hunting income would fall into two categories, those relating to the size of the resource base, and those relating to management of the hunting enterprise. Factors relating to the size of the resource base include total number of acres owned, number of acres available for fee hunting, size of the livestock enterprise (cows or ewes in the breeding herd), and whether the property is a resort or not. An additional factor

considered was age of the operator, the hypothesis being that younger operators might be more willing to diverge from a traditional livestock operation into fee hunting.

Factors relating to management of the hunting enterprise include whether permission is sold by lease or permit, number of services provided with the hunt, whether hunt is guided or unguided, whether paying hunters are Utah residents or not, number of years landowners have been involved in fee hunting, whether the number of hunters on the property at one time is restricted, and whether landowners actively manage for deer and elk by censusing, consulting with a biologist, or making habitat improvements.

Both regression and discriminant analysis were used to explore the relationships between these factors and net fee hunting income. In addition, factors were subdivided and grouped in various ways to try to enhance any underlying influences.

None of the factors hypothesized to influence net fee hunting income were significant. There were no relationships between net income and any of the factors.

The most striking feature of the data collected is their diversity. Landowners have very different types of properties and manage their hunting enterprises in a variety of ways. This diversity made it difficult to aggregate data for analysis. Attempts to enhance similarities through aggregation resulted in more information being lost than gained. In

addition, grouping information in ways that are not suggested by the data themselves reflects investigator bias and should be avoided.

This diversity implies that, despite the length of time fee hunting has been occurring in Utah, the market is immature. In particular, there is imperfect information both among and between suppliers and demanders. Landowners are not aware of what others are doing, and choose their management practices to meet their own needs with very little reference to the market as a whole. Examples of the type of information they do use is basing their fees on those charged by their nearest neighbors, and accepting what hunters offer. Only 22% charge what they think the market will bear, and even then they may not have a good idea of what that fee actually could be. During the telephone interview, many landowners expressed a desire for more information about what other landowners are doing, and also wished to be put in touch with hunter groups.

Better communication among and between suppliers and demanders may help landowners select management practices that maximize net fee hunting revenue. However, it may also be that fee hunting opportunities are primarily dependent on the resource base or state wildlife management policies. If that is the case, fee hunting management practices will be influenced by those constraints more than any others. Since the resource base of landowners in Utah is extremely diverse, fee hunting management may also remain diverse.

2. Factors Associated with Willingness of Landowners to Make Habitat Improvements

As with net fee hunting revenue, factors hypothesized to be associated with willingness of landowners to make habitat improvements were grouped into those relating to the size of the resource base and those associated with management of the hunting enterprise. Factors relating to the size of the resource base include gross ranch income, percentage of gross ranch income from fee hunting, total acres owned, acres available for hunting, size of the livestock enterprise, whether property is a resort, charging for small game hunting, and age of the operator.

Factors associated with management of the hunting enterprise include net fee hunting income, number of services available, whether the number of hunters allowed on the property at one time is limited, number of years landowners have been charging, whether hunters are Utah residents, and whether landowners census deer or elk or consult with a wildlife biologist.

Again, none of these factors were significantly associated with willingness of landowners to make habitat improvements. This is despite the fact that 68% of those that make habitat improvements offer guided hunts or are resorts or planned unit developments. Because so few landowners had made habitat improvements, any differences between them became important. As a result, the diversity in the data was

amplified making trends difficult to discern.

During the telephone interview, some landowners expressed a genuine interest in the deer and elk on their property and making habitat improvements. Apparently this interest is independent of either resource base or fee hunting management practices.

Because fee hunting landowners are deriving some value from the deer and elk on their property, it has been assumed that they will undertake activities, such as habitat improvements, designed to enhance that value. Therefore, it was hypothesized that landowners who receive higher value (net revenue) from fee hunting, or those that are more involved in their hunting enterprises (such as by offering more services), would be more likely to make habitat improvements. However, for this to be the case, landowners must be able to capture any increased value of the wildlife resource resulting from their habitat improvement activities. In Utah, the migratory nature of deer and elk, combined with the mosaic of landownerships, makes it difficult for a landowner to be certain of capturing this increased value. The only landowners who can be somewhat certain are those who own property that comprises most of a herd unit area. There are a few such landowners in Utah, but there was no way of identifying who among the survey respondents they are unless they happened to so indicate. It is safe to say that most of the survey respondents do not fall into that category however, and

therefore the lack of relationship between fee hunting income or activities and habitat improvement is not surprising.

One way to improve the certainty of getting a return from wildlife habitat improvements would be for landowners to form cooperative associations such that the total land area in the association comprises most or all of a herd unit. This is only possible where most of a herd unit is on privately owned land such as in parts of northern Utah. There are many cooperative associations already in northern Utah. This research did not investigate their organization. However, comments made during the telephone interviews create the impression that they are organized according to the ability of neighbors to get along with each other or from a desire to form a land unit that minimizes the effort and costs associated with managing hunters and preventing trespassing. There was no mention of a desire to specifically incorporate the land area designated as a herd unit into a fee hunting association.

3. Discussion

It was hoped that this phase of the research project would be helpful in (1) designing management strategies for landowners interested in improving the efficiency of their fee hunting enterprises and thereby maximizing net ranch income and (2) identifying features of fee hunting enterprises that, if enhanced, might result in more landowners making wildlife habitat improvements. Instead, this research has

demonstrated (1) the need for more information among and between fee hunting landowners and hunters so that preferred and more efficient management practices can develop, and (2) no firm relationship between fee hunting management or resource base and wildlife habitat improvement.

These results prompt two recommendations. The first is that landowners offering recreation opportunities form some type of organization to facilitate the exchange of information and develop marketing strategies. Such an organization could be a sub-group of an already existing organization such as the Utah Cattleman or Utah Woolgrowers, the Utah Farm Bureau, or the Utah section of the Society for Range Management.

The second recommendation is recognition by hunters, the DWR, and policy makers that landowners cannot be expected to make habitat improvements unless they have a reasonable chance of capturing some benefit from that expense. Fee hunting is providing compensation for hunter costs and for forage consumed by deer and elk. There must be a substantial increase in fee hunting income if it is to provide a return on habitat improvements as well. No one can expect a business manager to make investments where the return is small or very uncertain.

Policy Analysis

The information and relationships discussed in the previous three subsections will be used in a policy analysis to assess how well fee hunting is resolving or mitigating problems associated with wildlife habitat and hunter access on private land.

1. Introduction

Policy provides the administrative, legal, and philosophical framework in which management decisions are made. Policy changes are stimulated by a perceived opportunity to increase benefits or the need to solve problems.

Policies may be evaluated or judged in many ways. The following questions incorporate criteria that are relevant to policy analysis in a democratic society.

1. Is the policy voluntary? Do the people affected have a choice about participating?

2. Are costs and benefits distributed fairly? Do those paying high costs get high benefits?

3. Does a policy promote economic efficiency? Are human and other resources used efficiently and allocated to areas of highest priority? Are transaction and enforcement costs minimized?

4. Are the affected persons and society in general informed about a policy and the costs and benefits it influences?

5. Is the policy likely to be stable, or are there forces inherent to it (such as built in incentives) that will promote instability?

6. Does a policy generate a positive sum (win-win or win-neutral) situation, or must someone lose?

In evaluating fee hunting as a proposed policy solution to the problems of wildlife habitat and hunter access on private land, it is important to identify, and if possible quantify, the benefits and costs of fee hunting to the various parties affected by fee hunting. These can then be compared to benefits and costs without fee hunting. The discussion on setting and situation for landowners, wildlife, hunters, and the DWR outlined some of the benefits and costs without fee hunting. The following discussion will evaluate the research results described in previous sections in order to identify benefits and costs with fee hunting. Results are discussed separately for landowners, hunters, and the DWR. For each group, there is a series of statements which, if true, indicate a positive policy impact of fee hunting. These statements are evaluated with respect to the results of this research.

2. Effects of Fee Hunting on Landowners

1. Wildlife and Hunter Management Goals Are Met.

Most landowners indicated that they are very satisfied with fee hunting as a means of minimizing the costs of hunters

and wildlife on their property. However, 33% indicated that they have had some problems with their paying hunters, particularly with property and road damage and trespassing. Generally, landowners did not express much concern over costs caused by wildlife such as forage consumption. In fact, many stated that they are proud to have deer and elk on their properties and have a genuine interest in their welfare. This research did not compare attitudes towards wildlife of landowners who are and are not engaged in fee hunting. In general, fee hunting is effective in meeting landowner goals for wildlife and hunter management.

2. Net revenue is positive.

Approximately 80% of fee hunting landowners are earning a positive annual net cash income from fee hunting if costs of owner or manager labor are not included in the calculations. Recalling that many landowners view fee hunting as a cost minimizing strategy, the 20% who had a negative annual net cash income may have lost less money as a result of fee hunting than they would have lost without it. None of the landowners indicated that they were aware of losing money. In fact, all appeared satisfied with the income they received. In addition, landowners universally expressed satisfaction with fee hunting as the best means of reducing costs associated with trespassing hunters. This reduction in costs does not show up as immediate cash income, but is certainly

important for the overall profitability of the ranch enterprise.

3. Average time landowners have been involved in fee hunting is more than two years (i.e., landowners do not try it, decide they don't like it, and quit).

Seventy-three percent of fee hunting landowners have been charging for at least five years, and 51% have been charging for at least 10 years. Clearly, there is a group of landowners who have been involved with fee hunting consistently for many years.

Twenty-seven percent have been involved in fee hunting for five years or less. There is no way of knowing whether they will continue with fee hunting in the future. As I did not detect any serious disaffection with fee hunting among fee hunting landowners, I feel safe in assuming that their intentions are to continue to charge for hunting on their land.

While screening landowners for the telephone survey, I encountered many who had charged previously but had not in 1986, or who had not charged in 1986 but were planning to soon. Apparently there is a group of landowners that move into and out of fee hunting as circumstances dictate. This research project did not investigate what factors might influence this group of landowners to initiate or leave fee hunting. Possible factors include resource constraints, management or policy

constraints, or differences in attitude toward hunters and fee hunting.

Resource constraints (not enough land or land not in the right location) are a likely reason why some landowners are not able to stay in fee hunting consistently. Research results indicate that in general fee hunting landowners are the larger ranchers, both in terms of number of acres and in size of livestock operations. In addition, fee hunting is occurring on privately owned grazing land. An additional prerequisite for successful fee hunting is that deer and/or elk be present on the property during the hunting season. It is possible that some landowners in Utah have big game on their property some years but not others due to differences in weather. In addition, some landowners may have big game on their property but not own enough land to make hunting consistently attractive to hunters.

There are many possible management or policy constraints that could influence the longevity of fee hunting enterprises. For example, the fact that the hunting season is of such short duration and is the same for all regions of the state creates special problems for fee hunting landowners. The three most frequent expenses mentioned by landowners were vehicle costs, road and facility maintenance, and trespass prevention. Trespass prevention is difficult because hunters are out all over the state at the same time. Road maintenance is required

because hunters have only a short time to hunt and cannot postpone using roads when weather makes them vulnerable to damage. Road and facility maintenance costs were one factor which helped explain the negative net cash income of some fee hunting landowners. Vehicle costs partly involve posting and patrolling the property to deter trespassers and checking for damages caused by trespassers. All of these costs could likely be reduced if the hunting season were longer or if fee hunting landowners could have legal seasons at different times than those on public land. Lower costs might make fee hunting feasible for more landowners.

Also recall that several of the factors that helped explain a negative net cash income for fee hunting landowners result from management decisions under their control. Two examples are moving livestock early and therefore having to purchase alternative sources of forage and charging only a minimal fee or an exchange of labor in return for permission to hunt. It is possible that landowners who tried fee hunting and found it not profitable decided to engage in the latter.

To summarize, the average length of time landowners have been involved in fee hunting is more than 2 years. However, there is a group of relative newcomers, the 27% who have charged for less than 5 years. Further, there is an unknown number of ranchers who intermittently try fee hunting. Any policies designed to enhance fee hunting opportunities for

landowners could investigate and address factors that influence their participation under current conditions.

4. Landowners express satisfaction with their involvement with fee hunting.

As has already been discussed, landowners seemed pleased with their fee hunting enterprises. Many landowners stated that they would prefer not to deal with either hunters or wildlife. However, since they have no choice, fee hunting is the best way to cope. Most stated that fee hunting is the only feasible way they have found to manage their property during the hunting season and lower the costs associated with having hunters and wildlife on their property. It is important to recall, however, that one-third of fee hunting landowners still reported problems with trespassing and property damage by hunters. Thus, fee hunting as it is currently practiced appears to be the best option under the present circumstances, but does not solve all hunter and wildlife problems.

3. Effects of Fee Hunting on Hunters

1. A range of hunting opportunities is available that is different from public land hunting opportunities.

a. Number of hunters is restricted resulting in greater privacy for paying hunters.

At least sixty-five percent of fee hunting landowners restrict the number of hunters allowed on the property at one time. As a result, the average number of acres per hunter on

private land is 394. In contrast, calculations summing the number of acres of land managed by the U.S. Forest Service, Bureau of Land Management, Division of State Lands and Forestry and Division of Wildlife Resources divided by the number of hunters afield (less private land hunters) in 1986 yield an average of 213 acres per hunter on public land. Therefore, private land hunting opportunities apparently can be differentiated from those on public land by the availability of more acres per hunter.² In addition, with private land hunting opportunities, hunters know ahead of time approximately how many hunters to expect where they plan to hunt and even who the other hunters are likely to be (at least they will be members of the same club even if they are not personally known). This type of certainty alone may be worth paying for.

b. Trophy animals are available.

Only 6% of landowners indicated that they think the opportunity to hunt a trophy animal is the most important reason hunters pay to hunt on their property. The migratory nature of deer and elk in Utah, coupled with landownership patterns, makes it unusual for a landowner to have enough

²Since deer and elk are concentrated in the mountains and foothills during the October hunting seasons, it is likely that the calculation of 213 acres per hunter on public land is high. The number of acres per hunter on private land may be as much as four times the number of acres per hunter on public land.

property in the right location to be able to manage an actual deer or elk herd all year long to improve its trophy potential. Without that control, both habitat management and wildlife harvest strategies on private land yield uncertain returns. The same animals may not return to the property next year, or they may be intercepted by hunters on public land. Therefore, few landowners are able to guarantee improved trophy hunting opportunities to paying hunters, nor do they have an incentive to try to do so.

The Utah Division of Wildlife Resources has set several areas aside as limited entry or 3-point and better hunting areas. The objective of these designations is to increase the acreage available to individual hunters and also to improve the trophy potential of the herds in those areas. Both of these strategies have the potential to benefit neighboring landowners who can be involved in fee hunting because the quality of animals is improved and the number of potentially trespassing hunters is reduced. However, permits for these areas are issued by lottery. Therefore, the improvement in animal quality is offset by the inability of landowners to guarantee a permit to those hunters who might be interested in hunting on private property. In this case, the policy constraint affects both landowners and hunters who have an interest in hunting on private land.

In recognition of this problem and of the habitat

provided by landowners in one limited entry area, the DWR is experimenting with issuing permits to landowners according to the amount of land they own within the limited entry area. Landowners with eligible property participate in a lottery for a certain number of permits. Landowners who draw permits can then assign the permits to any individual they want. This way some landowners have an opportunity to get permits to those hunters who are willing to pay to hunt on the property. Note that there is no charge for the hunting permit other than what the hunter pays the DWR and the permit does not include permission to hunt on private land. Permission is an arrangement strictly between the landowner and the hunter. This experiment had its second season in 1988, and so far has been favorably received by hunters, landowners, and DWR personnel involved in managing the program (Bunnell, pers. comm.). Without cooperation like this, fee hunting landowners whose land is occupied by migratory game herds cannot offer a greater likelihood of getting a trophy than is available on public land.

c. There is a likelihood of more eligible animals per hunter.

There is no way to estimate and compare the animal densities on private and public land. However, given that there is more land per hunter available on private land, it is reasonable to infer that there are therefore more animals

per hunter. Landowners indicated that they think they offer more animals per hunter. In addition, hunters think that private land hunting opportunities provide more animals per hunter (Jordan and Austin 1987, unpublished). Landowners that knew the success rate of their hunters indicated that it was much higher than that on public land (greater than 50%, and often greater than 80%, compared with 30%-40% on public land (Anonymous 1987)).

d. Services such as guiding and lodging are available.

Most of the hunting opportunities offered by fee hunting landowners are similar to those on public land in terms of number and types of services included in permission to hunt. Most landowners offer no services or offer only a place to camp and perhaps water and firewood. Only 12% of landowners offer hunting opportunities that include services not typically available on public land such as guides, lodging, meals, and help with game. Therefore, although these opportunities are available, they do not appear to be a predominant feature of private land hunting opportunities in Utah.

2. Local or resident hunters avail themselves of fee hunting opportunities.

Only 15% of the landowners indicated that less than half of their hunters are Utah residents. Therefore, resident

hunters are taking advantage of the fee hunting opportunities in Utah. Many of the fee hunting opportunities are arranged through hunting clubs whose memberships are typically local.

4. Effects of Fee Hunting on the Utah Division of Wildlife Resources

1. Landowners coordinate management goals with the DWR.

Only 25% of fee hunting landowners have ever consulted with a wildlife biologist about managing the deer and elk on their property. The biologist they consulted was usually an employee of the DWR. Landowners are prohibited from practicing wildlife management such as manipulating sex ratios. However, they can, through the intensity of harvest and type of animal they allow to be harvested on their property (for example 3-point and better bucks), engage in some game management. Nevertheless, most landowners do not manage deer and elk at all. For example, only 19% have ever censused the deer and elk on their property.

There has been a long history of antagonism between the DWR and fee hunting landowners which has only recently begun to recede. This atmosphere of antagonism has prevented communication and mutual support. Landowners often stated that they did not want to talk to or deal with the DWR, and when they did, the DWR was not helpful. Many landowners think game management objectives are set without taking their opinions into account.

Current policies governing fee hunting have not served to improve landowner willingness to coordinate wildlife management goals with those of the DWR. The DWR is presently reevaluating its attitude toward fee hunting with the objective of formulating new policies. This research project is part of that reevaluation.

2. Private land deer and elk habitat is maintained or improved.

Only 20% of fee hunting landowners have ever improved habitat specifically to benefit the deer and elk on their property, and only 10% improve habitat annually. Since no comparisons were made with landowners not involved in fee hunting, it is not possible to say whether this rate of habitat improvement is different for fee hunting landowners. Clearly, there is not as much effort put into habitat improvement as fee hunting proponents had hoped. On the other hand, fee hunting landowners are not taking actions that exclude deer and elk from their property. Thus, fee hunting at least is resulting in maintenance of present deer and elk habitat availability and quality.

3. Resident hunters avail themselves of fee hunting opportunities.

The DWR is charged with managing wildlife for the benefit of the residents of the State of Utah. Therefore, the DWR is concerned that any actions taken by others with regard to

wildlife not jeopardize the ability of Utah residents to obtain benefits from wildlife. If one result of fee hunting were to limit resident hunting opportunities in favor of those for non-residents, that would be a legitimate reason for the DWR to view fee hunting with disfavor.

As previously discussed, resident hunters do not appear to be excluded from most fee hunting opportunities. In fact, in many cases fee hunting has been initiated by resident hunters who have formed clubs which then arrange to lease private property for the club's exclusive use.

5. Discussion

There are three potential benefits to society to be derived from fee hunting. These are improved viability of the agricultural sector, improved management and habitat for wildlife, and better hunting experiences. The ability of fee hunting to provide better hunting experiences has already been discussed.

1. Viable agricultural sector.

By minimizing costs of hunters and wildlife on private property and providing a source of additional income not directly influenced by world markets for agricultural or extractive natural resource products, fee hunting contributes to the viability of the agricultural sector. However, it seems to be the larger (and presumably more profitable) landowners that are involved in fee hunting, rather than the more

marginal operations.

To make a bigger impact on the viability of the agricultural sector, fee hunting must involve more ranchers, particularly those whose economic situation is precarious. Helping this group to remain solvent will have more effect on rural families and communities than an increment of increased profitability of the larger and already profitable ranches. Research into factors that inhibit landowners from participating in fee hunting would be valuable.

2. Wildlife management and habitat improvement.

Fee hunting has not fostered dramatic improvements in wildlife management or habitat. There are several explanations for this, most of which condense to profitability. When landowners have little control over the deer and elk on their property due to their migratory nature and the intermingling of ownerships, it makes no economic sense for landowners to invest in deer and elk management (such as harvesting to improve the trophy potential of the herd) or habitat improvements. In fact, the types of investments they do make in their hunting enterprises (amenities for hunters, investments to improve wildlife and hunter control) are the most rational for them to make. These types of investments yield a direct return in the form of increased revenues or decreased costs. Applegate (1981) discussed research showing that it is economically feasible for landowners engaged in fee

hunting to make improvements for hunters but not for wildlife habitat. On the other hand, Guynn and Steinbach (1987) argue that landowners in Texas are making large investments for wildlife as a result of their involvement in fee hunting. However, the investments they mention are deer proof fences and feeding stations. In my opinion, these are investments to improve the salability of deer rather than their health and welfare.

It seems likely that those landowners who have made habitat improvements are situated such that they have the same deer or elk herd on their property most of the year (and thus can generate a return on that investment), or simply have an aesthetic interest in big game and are willing to make the investment without expecting a monetary return.

The average net fee hunting income for landowners without considering owner or operator labor was only \$6587 in 1986. Generally, it is not possible to make very extensive habitat improvements for that amount of money. Habitat improvements that would be most helpful for big game in the areas where fee hunting is prominent (northern Utah) include oak brush and juniper control and deferred spring grazing of crested wheatgrass. Deferred spring grazing of crested wheatgrass leaves standing dead material which acts as a black body to melt snow quickly. This improves the availability of spring regrowth for deer (Austin et al. 1983, Austin and Urness

1983). Deferred grazing is only feasible for landowners when they have other sources of early spring forage for livestock.

In Utah there are many landowners who contribute winter habitat for deer and elk but cannot engage in fee hunting because they do not have enough land or because there are no deer or elk on their property during the hunting season. Devising a way to involve them in fee hunting would compensate them for their contributions to habitat and improve their economic situation. A cooperative association is one way to involve all the landowners in a herd unit who contribute wildlife habitat. However, under present policies there is no incentive for landowners who can engage in fee hunting to include in their cooperative associations those landowners who contribute winter habitat but do not have land suitable for hunting. A major policy objective could be to find ways to encourage cooperative associations that involve all landowners who contribute habitat. In turn, these cooperative associations could be encouraged to be more directly involved in wildlife management decisions.

There are some conflicts of interest inherent in landowner involvement with wildlife management and habitat improvement. Although the DWR ostensibly wants those engaged in fee hunting to become involved in the welfare of the wildlife resource, in fact DWR personnel may feel proprietary toward Utah's wildlife. Many DWR employees think that care for

and management of Utah's wildlife is exclusively their responsibility and that they are the only ones with the necessary expertise and perspective. In addition, many feel that they are managing big game exclusively for the public land hunter, and that any management activity that furthers fee hunting is undesirable. It may be that landowners are berated for getting a benefit from deer and elk without giving anything back while at the same time being discouraged from becoming an active partner in deer and elk management. There are examples where landowners have tried to manipulate herd characteristics to better match the available habitat as well as improving the fee hunting opportunities but have experienced difficulty in getting the approval and cooperation of the DWR. Although these attitudes are changing, rapport between the DWR and landowners could be improved.

6. Conclusions

In conclusion, it is appropriate to evaluate what has been learned about fee hunting with respect to the criteria for policy analysis mentioned at the beginning of this section.

1. Is the policy voluntary?

Clearly, current involvement in fee hunting is voluntary for both landowners and hunters. There are ample alternative opportunities for hunters on public land. Therefore, hunters may choose whether or not to participate in fee hunting. The

only constraint on landowners is whether they have the resources and desire to get involved.

2. Are the costs and benefits distributed fairly?

This criterion is more complex to evaluate. There appear to be two groups of landowners who can be distinguished by their contributions to wildlife and hunting opportunities. One group owns large amounts of mostly grazing or hay land and is less involved in crop production (except hay). This group has deer and elk on the property during spring and fall, possibly during summer, and if the property extends low enough in altitude, also in the winter. Their major costs are associated with hunters rather than deer and elk. It is this group that is involved in fee hunting. Fee hunting helps offset hunter costs. Because deer and elk consume forage rather than crops for this group, they are not eligible for payments through the Landowner Assistance Program (LAP). Note that this is a generalization. Many of these landowners suffer depredation on hay, for which compensation is allowed. However, they may choose to be compensated through fee hunting rather than through the LAP. A comparison of the names of those who had received payments through the LAP during the five years prior to 1986 with the names of fee hunting landowners showed very little duplication, even during exceptionally bad winters.

The second group of landowners owns mostly crop or orchard land and has deer or elk on the property during the

winter. The land is generally not suited for hunting because of its size, agricultural use, or proximity to human settlement. These landowners suffer costs due to the presence of wildlife rather than hunters, and often are eligible for compensation through the LAP.

It may be that costs and benefits associated with hunters and big game on private land are more equitably distributed with fee hunting than without it because there is presently no other mechanism for compensating landowners for hunter costs like there is for wildlife costs.

Hunters, through license fees and excise taxes on sporting goods equipment, pay most of the costs of wildlife management. As a result, they expect to reap most of benefits. Hunters often resent paying for game management and then having to pay again to get access to land to hunt. However, it is important that hunters recognize that they pay for game management, not hunter management. In Utah, it is hunter behavior on private property that has generated the desire to charge a fee. If landowners were allowed to claim for damages caused by hunters like they can for crops damaged by wildlife, the DWR budget would not go very far toward wildlife management.

3. Does a policy promote economic efficiency?

Fee hunting has apparently developed to meet a need to redistribute costs and benefits associated with hunters and

wildlife on private property. Fee hunting is only possible where there is a willingness to pay for the opportunities it provides. Involvement in fee hunting would not have occurred or persisted if it were inefficient or did not provide a desired opportunity. On the other hand, the extent of fee hunting is significantly constrained by DWR policies such as the short statewide general deer and elk hunting seasons and the lottery system for issuing permits for certain species and in some areas. It may be that relaxing these constraints could improve economic efficiency by allowing more hunters to bid for the opportunities they desire and more landowners to bid for the opportunity to fulfill those desires. In Utah, where income from livestock and crop production is uncertain, and where most of the population is urban, flexible policies which would allow landowners to explore the opportunities for income from providing various recreation experiences could be beneficial.

4. Are the affected persons and society in general informed about a policy and the costs and benefits it influences?

The answer to this question has been no. The role of fee hunting in redistributing costs and benefits is often unclear even to the participants, much less the general public and policy makers. Without good information, many prejudices have developed. Because the role of fee hunting is not immediately

and accurately apparent, it is important that research like this project be conducted and the results and analyses publicized to all interested persons. This is a job for people in university extension or DWR information and education.

5. Is the policy likely to be stable?

Fee hunting under current policy prescriptions has been stable. Landowners who can make it work stay with it. Also, many mentioned that they have the same hunters from year to year. Therefore, hunters involved in fee hunting are stable also. However, the misinformation and prejudices surrounding fee hunting jeopardize this stability. There are some who would like to see fee hunting expanded, and some who would like to make it illegal. The current level of fee hunting exists because of a window of opportunity in very traditional and long-term policy conditions. Therefore, the traditional public land hunter cannot complain that a change in policy has generated fee hunting and thus constrained his or her hunting opportunities. Any proposed change in policy will have to be weighed against the likelihood of public misunderstanding and prejudice regarding fee hunting.

6. Does a policy generate a positive sum situation?

The present conditions under which fee hunting operates in Utah increase hunting opportunities while not substantially interfering with public land hunting. Fee hunting landowners are not closing off access to public land, nor are they

restricting access to most public game since deer and elk are mostly on publicly owned mountain and foothill ranges during the hunting season. As a result, fee hunting is more or less politically acceptable at this time. On the other hand, several benefits which proponents had hoped fee hunting would generate are only partially realized. These are (1) involving, and thus providing compensation to, more landowners, particularly those who provide winter habitat but who do not have deer and elk on their property during the hunting season, and (2) improving wildlife habitat by landowners and coordinating management goals with those of the DWR. Increasing the likelihood that these benefits will be more fully realized will require substantial policy changes. Given the level of misunderstanding and prejudice surrounding fee hunting, such policy changes may not be politically feasible. Thus, although present fee hunting efforts in Utah may not be providing all the benefits possible, this may be a case where "if it ain't broke, don't fix it".

CONCLUSIONS

Utah landowners engaged in fee hunting are typically livestock ranchers raising beef cattle, sheep, and crops in support of the livestock operation. They own more acres and have larger livestock herds than the average Utah livestock rancher. They have owned their property for an average of 56 years and have been raised in Utah. Most have been involved in fee hunting for at least 5 years, and more than half have been involved for at least 10 years. Fee hunting is not a new phenomenon brought to Utah by people from out of state purchasing ranching property in order to initiate fee hunting.

Fee hunting is concentrated in northern Utah where there is privately owned mountain and foothill rangeland. This land is used for livestock grazing and other recreation as well as fee hunting.

There is great diversity in the organization and management of fee hunting enterprises in Utah. Enterprises vary according to the amount and type of land available for hunting, animal to be hunted, how permission is sold, length and type of hunting seasons, services provided, and responsibilities and restrictions expected of paying hunters. All of these factors affect both the fees charged and expenses incurred by landowners.

Income from fee hunting averages \$6587 per year, or \$0.66 per acre, and usually contributes less than 10% of gross ranch

income. Expenses vary according to the type of hunting opportunity since most are associated with providing services. However, road and facility maintenance and vehicle expenses are common regardless of hunt type.

Hunting opportunities are of two principle types, lease or permit. Typically, with a lease system few services are provided and hunters are expected to fulfill responsibilities such as guarding gates and posting and patrolling the property. With a permit system, more services may be provided and the landowner generally bears more responsibility for such activities as posting and patrolling the property.

Most hunting opportunities under either a lease or permit system include few or no services. Fee hunting opportunities in Utah are primarily distinguished from those on public land by fewer hunters per acre rather than by the availability of special services or trophy animals. Fee hunting serves mostly resident hunters.

Landowners initiated fee hunting in order to gain control over trespassing and cover the costs of having hunters on their land. Generally, landowners view their livestock operations as their principle enterprise and fee hunting as a sideline. Consistent with this orientation, only one-fourth have made investments in their hunting enterprises, and only 20% have made habitat improvements specifically for wildlife.

Because of the diversity of fee hunting enterprises in

Utah, it was not possible to discover any relationships between size of the resource base or management of the hunting enterprise and either net fee hunting income or willingness of landowners to make habitat improvements for wildlife. There are two possible explanations for the lack of discernible relationships. One is that landowners have been managing their resources individually without reference to what others (except neighbors) are doing because of insufficient information both among and between landowners and hunters. If that is the case, more and better information could help landowners increase the efficiency of their hunting enterprises.

A second possible explanation is that management of fee hunting enterprises is primarily dependent on the type of resources (primarily land) the landowner has available. Since in Utah resources are likely to be very diverse, hunting enterprises will necessarily be diverse as well. In that case, improved information may not increase hunting enterprise efficiency and no other relationships besides those relating to diversity will be salient.

Fee hunting is meeting the needs of landowners to prevent trespassing and minimize costs associated with hunters. However, fee hunting does not involve those landowners who provide important winter habitat for deer and elk yet do not have deer and elk on their property during the hunting season.

It is unclear whether changes in hunting policies would enable those landowners to become involved in fee hunting. They often own property unsuitable for hunting because of small size or proximity to human settlement. It may be preferable to reach those landowners through the Landowner Assistance Program (LAP) rather than trying to expand fee hunting to include them. They are eligible for the LAP because their costs are from wildlife consumption of crops rather than hunter damage to property, as is the case for landowners now engaged in fee hunting.

Fee hunting is providing a variety of hunting opportunities to mostly resident hunters. Fee hunting in general is not interfering with public land hunting opportunities. Thus, in Utah, fee hunting can be viewed as augmenting hunting opportunities rather than substituting fee hunting for free public hunting.

The major area where benefits from fee hunting could be improved is wildlife management. Landowners do not communicate or coordinate with the DWR with regard to deer and elk management, nor do they improve habitat specifically to benefit wildlife. Changing these behaviors will require changes in attitude on the part of both landowners and the DWR and changes in incentives for wildlife habitat improvement. Intermingling landownerships and the migratory nature of deer and elk make it difficult for landowners to

capture any benefit from habitat improvements or game management efforts such as harvesting only 3-point or better bucks. Given the fluctuating nature of income from agriculture, it is unreasonable to expect landowners to make investments where a return is uncertain. However, policy changes which will improve the ability of landowners to capture a return on investments in wildlife management or habitat improvement will need to be fairly extensive, and likely will not be viewed favorably by other interest groups in the state. Sponsors of proposals which substantially alter policies in favor of fee hunting must be prepared to deal with the latent hostility of public land hunters and many DWR personnel toward fee hunting. The benefits of such policy changes must be weighed against the possibility of disrupting the somewhat precarious detente that presently exists. It is very difficult to explain to some segments of the public that fee hunting provides a public service which could be improved upon. Fee hunting may yet be too volatile an issue to withstand policy manipulation given that the extent of policy change must be quite large in order to affect the desired benefits.

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APPENDIX

APPENDIX

This is Lucy Jordan from Utah State University in Logan. I sent you a letter recently telling you about a research study I am doing and that I would be calling. Did you receive the letter?

[If not, perhaps I did not have your correct address.]

The research study is about deer and elk hunting opportunities on private land in Utah. I am calling people throughout Utah to get information, and your name has been selected as one of the people to call.

For the survey I need to talk to a property owner or manager of income producing rural land in Utah, such as a farm, ranch, or mine.

The phone survey usually takes about 20 minutes.

Any information you give me will be STRICTLY CONFIDENTIAL!

Results will be presented as state or county averages so that no one can relate information to a particular person.

Would you be interested in helping me out with this survey?

NO THANK YOU VERY MUCH FOR YOUR TIME

YES

Would you have the time now to answer a few questions, or would you prefer that I call back later?

NOW [BEGIN SURVEY]

LATER [READ STATEMENT BELOW]

When would be a good time for me to call back?

Date: _____ Time: _____

Thank you for your time. I will call back at the time we discussed.

[SURVEY BEGINS]

As I mentioned, for this survey I need to talk to a property owner or manager, so let me begin by asking:

1. Are you the owner or manager of rural income producing land such as a farm or ranch in Utah?

YES [GO TO QUESTION 9] NO [GO TO QUESTION 2]

2. Is someone in your family an owner or manager?

____ YES [GO TO QUESTION 3]

____ NO

For this survey I need to talk to a property owner or manager, so I won't take up any more of your time.

Before I hang up though, I'd like to ask if you know of any landowners in your area who provide deer or elk hunting on their land for a fee.

____ NO Thank you very much for answering these questions.

____ YES Could you give me their names and the town they live in?

Thank you for answering these questions.

3. Is he or she available to talk to me now?

____ YES [RETURN TO INTRODUCTION]

____ NO

4. When would be a good time for me to call back?

5. Is this the right phone number to reach him or her? [LIST PHONE NUMBER _____]

____ YES _____ NO [GO TO QUESTION 7]

6. Who should I ask for?

Thank you very much for your help.

7. What is the right one? _____

8. Who should I ask for?

Thank you very much for your help.

9. Are you the owner, the manager, or both?

_____OWNER _____MANAGER _____BOTH

10. As far as you know, do any landowners in your area allow deer or elk hunting on their land?

_____YES _____NO [GO TO QUESTION 12]

11. Do any of those that allow hunters charge them a fee?

_____YES _____NO

12. Do you allow deer or elk hunters on your land?

_____YES _____NO [READ ## BELOW]

13. Do they pay a fee?

_____YES [GO TO QUESTION 14] _____NO [READ ## BELOW]

My survey is specifically about situations where hunters pay for deer and elk hunting opportunities on private land. Since you do not charge for deer and elk hunting on your land, I will not take up any more of your time.

Before I hang up though, I'd like to ask if you know of any landowners in your area who provide deer or elk hunting on their land for a fee.

_____NO Thank you very much for your help.

_____YES Could you give me their names and the town they live in?

Thank you very much for your help.

14. Does more than one person own or manage this property?

____ YES ____ NO [GO TO ***]

15. To help me avoid interviewing different people about the same property, would you tell me the names of the other owners or managers?

16. Who would be the best person to answer questions about the hunting operation?

17. How can I reach him or her?

18. When is the best time to call?

Thank you very much for your help.

*** Now I'd like to ask a few questions about the land you own or manage.

19. How many acres in Utah do you own or manage? ____

20. Is your land all in one piece?

(1) ____ YES [GO TO QUESTION 22] (2) ____ NO

21. If your land is in separate pieces, are they separated by:

(1) ____ PRIVATE LAND (2) ____ PUBLIC LAND (3) ____ BOTH

22. How many acres do you allow deer or elk hunters on?

DEER _____ ELK _____

23. In what county is the land you allow hunting on located? If the land you allow hunting on is located in more than one county would you estimate the percent in each county?

COUNTY	PERCENT
1. _____	_____
2. _____	_____
3. _____	_____

[CHECK TO SEE THAT THEY ADD UP TO 100%]

24. What is the nearest town to the land you allow hunting on?

25. Do you lease land from other landowners to make more land available to hunters?

(1) _____ YES (2) _____ NO [GO TO TOP OF PAGE 6]

26. How many acres do you lease?

27. Is the additional land you lease for hunters next to the land you own that you allow hunting on?

(1) _____ YES (2) _____ NO

28. In what county is the additional leased land located? If the leased land is in more than one county, would you estimate the percent in each county.

COUNTY	PERCENT
1. _____	_____
2. _____	_____
3. _____	_____

[CHECK TO SEE THAT THEY ADD UP TO 100%]

*** OK, now I'd like to ask you some questions about the hunting operation itself.

Some people lease their land to outfitters or to groups of hunters like a club, and some people deal with individual hunters directly.

29. Do you lease your land to an outfitter or group of hunters like a club?

_____ YES _____ NO [GO TO QUESTION 43]

30. How many acres do you lease out?

31. Do you charge by the acre, the season, or what?

32. What is the charge?

[REPEAT COST PER _____ TO MAKE SURE YOU HAVE IT RIGHT AND ALLOW RESPONDENT THE OPPORTUNITY TO CORRECT YOU]

33. What length of time is the lease for?

34. How did you decide what to charge for your lease?

[PROBE FOR UNDERLYING REASONS]

35. What animals are hunters allowed to hunt as part of this lease?

36. I will list some of the seasons for deer and elk available in Utah. Please indicate for each one whether you have hunters on your property for that season.

	<u>SEASON</u>	<u>HUNTERS PRESENT?</u>
<u>DEER</u>	GENERAL	_____
	ARCHERY	_____
	MUZZLELOADER	_____
	THREE-POINT OR BETTER	_____
	HUNTER'S CHOICE	_____
	ANTLERLESS	_____
	OTHER	_____
<u>ELK</u>	GENERAL	_____
	ARCHERY	_____
	MUZZLELOADER	_____
	HUNTER'S CHOICE	_____
	ANTLERLESS	_____
	OTHER	_____

37. Do you have a written lease or just a verbal agreement?

(1) _____ WRITTEN LEASE (2) _____ VERBAL AGREEMENT

38. Do you specify any rules or requirements for hunters or outfitters in your lease or verbal agreement?

(1) _____ YES (2) _____ NO [GO TO QUESTION 40]

39. Would you list the rules or requirements you specify?

40. Would you list for me what services, if any, you provide for the hunters as part of the lease agreement (for example, camping spots, firewood, or horses)?

SERVICES

41. Are there additional services that you provide for an additional fee?

(1) YES (2) NO [GO TO QUESTION 43]

42. What are they and what do you typically charge?

SERVICES

FEE

43. Do you charge fees to individual hunters to hunt for deer or elk on your land?

(1) _____ YES [GO TO THE STATEMENT JUST ABOVE QUESTION 44]

(2) _____ NO [GO TO QUESTION 53]

Now I'd like to get a description of the hunting opportunities you provide for individual hunters.

44. I will list some of the seasons for deer and elk available in Utah. Please indicate for each one whether you have hunters on your property for that season.

	<u>SEASON</u>	<u>HUNTERS PRESENT?</u>
<u>DEER</u>	GENERAL	_____
	ARCHERY	_____
	MUZZLELOADER	_____
	THREE-POINT OR BETTER	_____
	HUNTER'S CHOICE	_____
	ANTLERLESS	_____
	OTHER	_____
<u>ELK</u>	GENERAL	_____
	ARCHERY	_____
	MUZZLELOADER	_____
	HUNTER'S CHOICE	_____
	ANTLERLESS	_____
	OTHER	_____

45. Would you describe what different kinds of hunts, if any, you have during any of the seasons, for example, guided hunts or special trophy hunts, and how many hunters you had for each kind of hunt last year?

<u>DEER</u>	<u>TYPE OF HUNT</u>	<u>NUMBER OF HUNTERS</u>
-------------	---------------------	--------------------------

<u>ELK</u>	<u>TYPE OF HUNT</u>	<u>NUMBER OF HUNTERS</u>
------------	---------------------	--------------------------

46. What did you charge last year for each of the kinds of hunts you just described?

<u>DEER</u>	<u>TYPE OF HUNT</u>	<u>FEE</u>
-------------	---------------------	------------

<u>ELK</u>	<u>TYPE OF HUNT</u>	<u>FEE</u>
------------	---------------------	------------

[REPEAT ALL INFO TO MAKE SURE YOU HAVE IT RIGHT]
[CHECK TO SEE THAT YOU CAN CALCULATE TOTAL REVENUE]

47. How did you decide what fees to charge?

[PROBE FOR UNDERLYING REASONS]

48. OK, now I'd like to ask you some questions about services you provide for hunters. I'll list some services and I'd like you to tell me if they are included in the fees we just discussed or not. We will need to do this for each type of hunt. If a service is not included, I'd like to know if you provide it for an additional fee, and if so, what you typically charge. If there are services you provide that I don't mentioned, please add them to my list.

TYPE OF HUNT: _____

<u>SERVICES</u>	<u>INCLUDED</u>	<u>AVAILABLE</u>		<u>FEE</u>
		<u>YES</u>	<u>NO</u>	
Do you provide:				
(1) TRANSPORTATION TO PROPERTY	_____	_____	_____	_____
(2) CABINS	_____	_____	_____	_____
(3) MEALS	_____	_____	_____	_____
(4) CAMPING SITES	_____	_____	_____	_____
What about:				
(5) WATER OR ELECTRICAL HOOKUP	_____	_____	_____	_____
(6) FOOD	_____	_____	_____	_____
Do you provide:				
(7) FIREWOOD	_____	_____	_____	_____
(8) GUIDES	_____	_____	_____	_____
(9) VEHICLES OR HORSES	_____	_____	_____	_____
Do you:				
(10) FIELD DRESS GAME	_____	_____	_____	_____
Do you allow:				
(11) FISHING	_____	_____	_____	_____
(12) OTHER	_____	_____	_____	_____

49. Do you have any written rules or requirements for your hunters?

(1) _____ YES (2) _____ NO [GO TO QUESTION 51]

50. What are they?

51. Do you have any rules or requirements that you talk over with each hunter before the hunt that are not in writing?

(1) _____ YES (2) _____ NO [GO TO QUESTION 53]

52. What are they?

53. How many buck deer, if any, were harvested from your land last year?

_____ DON'T KNOW

54. How many antlerless deer, if any, were harvested from your land last year?

_____ DON'T KNOW

55. How many bull elk, if any, were harvested from your land last year?

_____ DON'T KNOW

56. How many antlerless elk, if any, were harvested from your land last year?

_____ DON'T KNOW

Now I'd like to ask some questions about things you might typically do each year to run your hunting operation. I would like you to use last year as an example.

57. Did you have any costs last year to control trespassing, such as posting signs, installing locks on gates, or hiring patrollers?

(1) _____ YES (2) _____ NO [GO TO QUESTION 59]

58. What do you estimate your total costs were to control trespassing?

\$ _____

59. Did you hire guides last year?

(1) _____ YES (2) _____ NO [GO TO QUESTION 61]

60. How much did it cost you to provide guides to your hunters last year?

\$ _____

61. Did you hire any other people to help with your hunting operation?

(1) _____ YES (2) _____ NO [GO TO QUESTION 63]

62. How much did it cost you?

\$ _____

63. Did other workers on your property help you out with your hunting operation?

(1) _____ YES (2) _____ NO [GO TO QUESTION 65]

64. How much do you figure it cost you to have other workers on your property help out with your hunting operation?

\$ _____

65. Did you serve meals to your hunters?

(1) _____ YES (2) _____ NO [GO TO QUESTION 67]

66. How much did serving meals cost you last year?

\$ _____

67. Did you use extra utilities last year just for your hunting operation?

(1) _____ YES (2) _____ NO [GO TO QUESTION 69]

68. Would you estimate the cost of the extra utilities?

\$ _____

69. Did you drive any extra miles on any vehicles because of your hunting operation?

(1) _____ YES (2) _____ NO [GO TO QUESTION 71]

70. How many extra miles?

71. If you supplied firewood, about how much firewood did your hunters use last year?

_____ [PROBE IF THIS IS EACH HUNTER OR TOTAL]

72. Did you need to repair or maintain roads, fences, campsites, or other facilities last year because of your hunting operation?

(1) _____ YES (2) _____ NO [GO TO QUESTION 75]

73. What did you do?

[PROBE FOR AMOUNTS OF MAINTENANCE OR MATERIALS AND KIND SO THAT COSTS CAN BE CALCULATED]

74. What do you estimate your maintenance cost you last year?

\$ _____

75. If you leased additional land for your hunters, how much did you pay per acre?

\$ _____

76. Just for your hunting operation, how much, if anything, did you spend last year for:

OFFICE SUPPLIES AND PAPERWORK \$ _____

TELEPHONE \$ _____

POSTAGE \$ _____

77. Did you use a lawyer or accountant last year to help with things about your hunting operation?

(1) _____ YES (2) _____ NO [GO TO QUESTION 79]

78. About how much did it cost you?

\$ _____

79. How much of your time do you estimate it took last year to run your hunting operation?

80. Were there other things you needed to do or purchase for your hunting operation last year? If so, would you describe them and estimate their costs?

ITEM

COST

81. What year did you first charge hunters a fee for hunting deer or elk on your property?

82. For the last question, I'd like to ask you to list any major improvements you've made to your property to make your hunting operation better, for example constructing camping sites, grading roads, or replacing or building new fences, and what year you made them.

IMPROVEMENT

YEAR

In order to avoid taking up any more of your time now, I'd like to ask if you would be willing to help me some more on this research project by completing and returning a mail survey.

The mail survey will ask you more questions about your hunting operation and also some questions about how else you use your land besides for hunting.

This will help me explain a little more about how farmers and ranchers, and others who own rural land in Utah, are providing hunting opportunities on their land.

Of course, the information you have given me and any more you provide on the mail survey will be strictly confidential.

83. Would you be willing to complete and return a mail questionnaire?

YES

NO [GO TO QUESTION 85]

84. What name and address I should send it to?

85. Would you be interested in receiving a copy of the results of this survey when I have the report written?

(1) _____ YES

(2) _____ NO [GO TO FINAL STATEMENT]

86. Should I send the report to the address you just gave me?

(1) _____ YES [GO TO FINAL STATEMENT]

(2) _____ NO

87. What address should I send the report to?

THANK YOU VERY MUCH FOR YOUR HELP!

DEER AND ELK HUNTING OPPORTUNITIES ON PRIVATE LAND
IN UTAH

A Statewide Survey



Research conducted by:



Lucy A. Jordan
Range Science Department
Utah Cooperative Fish &
Wildlife Research Unit
Utah State University
Logan, UT 84322-5210



SURVEY _____

To begin the mail survey, I'd like to follow up on our phone conversation with a few more questions about your deer and elk hunting operation.

1. Altogether, how many hunters (not including trespassers) came on your property during the deer and elk hunting seasons last year (if you're not sure, can you give me a good guess)?

_____ DON'T KNOW

2. What was the most deer or elk hunters you had on your land at one time last year (if you're not sure, can you give me a good guess)?

_____ DON'T KNOW

3. Do you do anything to limit the number of deer or elk hunters on your land at one time (or, if you lease to a group or outfitter, do they do anything to limit the number of deer or elk hunters on your land at one time)?

_____ YES _____ NO

4. What percent of your deer and elk hunters would you estimate are from Utah?

_____ DON'T KNOW

5. Did any of the deer and elk hunters on your land last year do anything that made you upset?

_____ YES _____ NO [PLEASE SKIP TO QUESTION 7]

6. What did they do?

[PLEASE TURN TO BACK OF PAGE TO CONTINUE]

7. Do you require hunters to sign a written waiver of liability?

YES NO

8. Do you buy extra liability insurance for your deer and elk hunting operation?

YES NO [PLEASE SKIP TO QUESTION 10]

9. How much did your liability insurance for your hunting operation cost last year?

\$ _____

10. Do you advertise?

YES NO [PLEASE SKIP TO QUESTION 13]

11. How do you advertise? Please indicate all that apply.

ADS IN LOCAL NEWSPAPERS

BROCHURES

ADS IN SPORTS SHOPS

ADS IN CITY NEWSPAPERS

ADS IN MAGAZINES

OTHER (specify)

12. How much did your advertising cost last year?

\$ _____ [Please check here if this figure includes postage]

The next few questions are about the wildlife on your land.

13. Please put an X indicating which months of the year you have deer or elk on your land. If you have deer or elk on your land all year long, just check under 'ALL'.

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>ALL</u>
<u>DEER</u>	—	—	—	—	—	—	—	—	—	—	—	—	—
<u>ELK</u>	—	—	—	—	—	—	—	—	—	—	—	—	—

14. Have you ever done anything with your land to make it support more deer or elk?

YES NO [PLEASE SKIP TO QUESTION 20]

15. What have you done?

16. How many acres were involved?

17. Do you do anything regularly, like each year, to make your land support more deer or elk?

YES NO [PLEASE SKIP TO QUESTION 20]

18. If yes, what do you do?

19. About how many acres are involved, on the average?

20. In ~~the~~ last five years, did you ever feed deer or elk on your property?

FED DEER

FED ELK

DID NOT FEED DEER OR ELK [PLEASE SKIP TO QUESTION 22]

[PLEASE TURN TO BACK OF PAGE TO CONTINUE]

21. During the year you fed the most feed, would you list what types of feed you used and how much (bales, tons, pounds).

	<u>TYPE OF FEED</u>	<u>AMOUNT</u> (please indicate whether bales, tons, pounds)
DEER	_____	_____
	_____	_____
ELK	_____	_____
	_____	_____

22. Do you count deer or elk on your property?

____ YES ____ NO [PLEASE SKIP TO QUESTION 24]

23. How often do you count them? Please check which category best applies.

____ COUNT WHENEVER I AM OUT DOING SOMETHING ON THE
PROPERTY

____ SEVERAL TIMES A YEAR

____ ABOUT ONCE A YEAR

____ LESS THAN ONCE A YEAR

____ OTHER (Please describe)

24. Do you ever talk with a big game biologist about deer or elk management on your land?

____ YES ____ NO [PLEASE SKIP TO QUESTION 26]

25. Please check which categories best apply to the big game biologists you have talked to.

The biologist was:

- A REGULAR EMPLOYEE OF YOURS
- AN EMPLOYEE OF THE UTAH DIVISION OF WILDLIFE RESOURCES
- AN EMPLOYEE OF ANOTHER PUBLIC AGENCY (for example, Soil Conservation Service or Extension Agent)
- A PRIVATE CONSULTANT
- OTHER (Please specify)

Next, I'd like to get some information about how you use the land you allow deer and elk hunters on during the rest of the year when it is not used for hunting.

26. Which of the following categories best describes what you do with the land you allow hunters on during the rest of the year when deer and elk hunters are not there? Please check all that apply.

- USE IT FOR GRAZING
- GROW CROPS
- RECREATION
- NOTHING
- OTHER (please describe other uses)

27. If the land you allow deer and elk hunters on is used for grazing at other times of the year, please state the seasons of use and class of grazing animal.

ANIMAL

SEASON OF USE

[PLEASE TURN TO BACK OF PAGE TO CONTINUE]

28. If the land you allow deer and elk hunters on is used for crops, please list what crops are grown.

CROP

(1)

(2)

(3)

29. If the land you allow deer and elk hunters on is used for recreation at other times of the year, please list the most common recreational uses (for example, fishing, snowmobiling, horseback riding).

Now I'd like to ask a few questions about your experiences in running a deer and elk hunting operation.

30. What are the two most important problems you've had in running your deer and elk hunting operation? (Please feel free to list more problems if you want to.)

31. If you were talking to people who were considering starting a deer and elk hunting operation like yours, what advice or warnings would you give them?

32. What changes in state or federal laws or policies would help your deer and elk hunting operation the most?

33. What do you think is the most different or special opportunity you offer to hunters? Why do you think hunters are willing to pay to hunt on your land?

[PLEASE TURN TO BACK OF PAGE TO CONTINUE]

Now I'd like to ask a few questions about what you do with your land besides run a deer and elk hunting operation. For these questions I am interested in all the land you own, not just the land you have hunting on.

34. The following list describes some ways different rural landowners make money from their land. Please indicate all that apply to you. If there are other ways you make money from your land besides those on this list, please include them.

- RAISE LIVESTOCK
- DAIRY
- RAISE CROPS
- RUN A RESORT, OR ALLOW OTHER NON-HUNTING RECREATION
- LEASE IT TO OTHERS FOR FARMING OR RANCHING
- LEASE IT TO OTHER LANDOWNERS FOR THEIR HUNTING OPERATION
- TRAPPING
- SMALL GAME, UPLAND GAME, OR WATERFOWL HUNTING
- TIMBER
- MINERAL/OIL/GAS
- OTHER (specify)
- _____
- _____
- _____

35. If you raise livestock, what kind of livestock do you raise?

- BEEF CATTLE
- SHEEP
- DAIRY COWS
- HORSES
- OTHER (specify)

36. If you raise beef cattle, how many head are in your breeding herd? (how many mature females did you have in your herd on Jan. 1?)

37. If you raise beef cattle, which of the following best describes your cattle operation? If none, please give me a brief description of your operation in your own words.

- _____ COW - CALF
- _____ COW - CALF - YEARLING
- _____ STOCKER
- _____ PUREBRED
- _____ OTHER (describe)

38. If you raise sheep, how many head are in your breeding herd? (how many breeding ewes did you have on Jan. 1?)

39. If you raise sheep, which of the following best describes your sheep operation? If none, please give me a brief description of your operation in your own words.

- _____ EWE - LAMB, MARKETING FEEDER LAMBS
- _____ EWE - LAMB, MARKETING FAT LAMBS
- _____ PUREBRED
- _____ OTHER (describe)

[PLEASE TURN TO BACK OF PAGE TO CONTINUE]

40. If you raise other livestock, please briefly describe the type of operation and its size.

41. If you run a dairy, how many cows do you milk?

42. If you raise crops, please describe your crop operation. For the following crops, would you state the number of irrigated or nonirrigated acres you have in each. Please list any additional crops which I have omitted.

<u>CROP</u>	<u>NUMBER OF ACRES</u>	
	<u>IRRIGATED</u>	<u>NONIRRIGATED</u>
(1) ALFALFA	_____	_____
(2) NATIVE MEADOW OR GRASS HAY	_____	_____
(3) SMALL GRAINS (WHEAT, BARLEY)	_____	_____
(4) FIELD CORN	_____	_____
(5) PINTO BEANS	_____	_____
(6) IMPROVED PASTURE SUCH AS CRESTED WHEATGRASS	_____	_____
OTHER (specify)		
(7) _____	_____	_____
(8) _____	_____	_____
(9) _____	_____	_____
(10) _____	_____	_____

43. If you run a resort, please list what services besides deer and elk hunting you provide (for example, rental cabins, snowmobiling, swimming) and approximately how many visitors you have in a year.

SERVICES

TOTAL NUMBER OF VISITORS _____

44. If you lease your land to others for farming or ranching, would you briefly describe what the land is used for.

45. What changes have you had to make in your regular operations to accommodate the hunting enterprise? (for example, have you had to move livestock out of the area earlier than usual, graze at different times of the year, prohibit picnicking or hiking?)

46. How much, if anything, do you estimate these changes have cost you?

\$ _____

[PLEASE TURN TO BACK OF PAGE TO CONTINUE]

47. Please check which category best describes your gross returns from all operations on your land last year?

- LESS THAN \$1,000
 \$1,000 TO \$9,999
 \$10,000 TO \$19,999
 \$20,000 TO \$39,999
 \$40,000 TO \$99,999
 \$100,000 AND OVER

48. Of the gross returns from your land last year, about what percent would you say was from your hunting enterprise?

- LESS THAN 10%
 10 - 24%
 25 - 49%
 50 - 74%
 75 - 100%

49. How many years has your family or corporation owned this property?

50. Which of the following categories best describes your age?

- 18 - 24
 25 - 34
 35 - 44
 45 - 54
 55 - 64
 65 OR MORE

51. Which category best describes where you were in school when you finished or left school?

_____ HIGH SCHOOL
_____ COLLEGE
MAJOR _____
_____ GRADUATE WORK
MAJOR _____

52. In what state did you spend most of your time between age 10 and age 18?

THANK YOU FOR YOUR HELP IN FILLING OUT THIS QUESTIONNAIRE!

PLEASE PLACE IT IN THE ENVELOPE YOU RECEIVED WITH THE QUESTIONNAIRE AND MAIL IT BACK PROMPTLY.

IF YOU HAVE A BROCHURE THAT DESCRIBES YOUR HUNTING OPERATION, OR COPIES OF LEASES OR OTHER WRITTEN INFORMATION YOU GIVE YOUR HUNTERS, I WOULD APPRECIATE IT IF YOU WOULD ENCLOSE THEM WITH THIS QUESTIONNAIRE WHEN YOU RETURN IT.

YOUR PARTICIPATION IN THIS RESEARCH IS VALUABLE AND VERY MUCH APPRECIATED.

VITA**LUCY A. JORDAN**

Range Science Dept.
Utah State University
Logan, UT 84322-5230
(801) 750-3161

158 E. Center St.
P.O. Box 515
Hyde Park, UT 84318
(801) 563-3644

OBJECTIVE:

To help develop, implement, evaluate and promote programs which provide rangeland managers and users with better incentives and information with which to make responsible decisions affecting range resource use and allocation.

EDUCATION:

1989 Ph.D. in Range Economics at Utah State University
1979 MS in Botany, Washington State University
1977 BS in Biology, Washington State University
1974-75 Utah State University, majors in Animal Science and Biology
1966-68 University of California at Berkeley, major in Anthropology
1963-66 Cornell University, major in Anthropology

EXPERIENCE:**RESEARCH**

An economic and policy analysis of private land hunting opportunities in Utah. Describes fee hunting for deer and elk and assesses the adequacy of current fee hunting efforts in addressing the problems of wildlife habitat, hunter access, and economic viability of ranches on private land in Utah. Ph.D. research project.

Marketing survey for a local restaurant to identify sources of customer dissatisfaction and make recommendations for increasing patronage. Research project, Small Business Development Center, U.S.U.

Literature review and legal history of land transfers that resulted from the Columbia Basin Project. Summer research project, part of a policy analysis. Political Science Dept., U.S.U.

Range plant physiology experiments on tolerance of grasses to herbivory. Research technician, Range Science Dept., U.S.U.

Plant metabolism studies on isolated cactus cells. MS research project.

L. Jordan

PROPOSALS

Wrote the proposal and obtained the funding for my Ph.D. research project. Project sponsors were the Utah Division of Wildlife Resources, Utah Department of Agriculture, Utah Farm Bureau, U.S.U. Institute of Political Economy, Utah Cooperative Fish and Wildlife Research Unit, and the U.S.U. Range Science Department. The budget for the two year research project, including the value of in kind support, was \$68,155.

CONSULTING

Advise the Private Lands/Public Wildlife Work Group of the Utah State Legislature on legislation pertaining to posted hunting units for small game and developing a similar program for big game. Ongoing.

Chair a work group composed of representatives of the Utah Division of Wildlife Resources assigned to analyze the Utah Landowner Assistance Program and make recommendations for the next five years. Ongoing.

Work with an environmental consulting firm to provide expertise to landowners interested in assessing and marketing wildlife-based recreation experiences from their land. Ongoing.

MANAGEMENT/ORGANIZATION

Managed and organized a research laboratory and a field research site including personnel, supplies, equipment, and experimental records and data. Facilitator in natural resources professional women's group. Organized and promoted county 4-H programs. Organizer for student activities group. Manage single parent household, employment, and education simultaneously.

TEACHING/PRESENTATIONS

Biology and range science teaching assistant for several years. Presented programs to 4-H leaders and the public. Presented research results at professional meetings and other appropriate occasions.

SUPERVISION

Supervised and trained laboratory and field assistants for research project. Supervised an assistant when teaching biology. Was in charge of the Cooperative Extension Office when the County Agent was absent.

PRACTICAL SKILLS/HOBBIES

Experience with writing proposals, computer analysis of data, word processing, design and administration of surveys, and utilizing 'high-tech' equipment to acquire information. Skills relating to farming/ranching, gardening, building, household repair and maintenance. Outside interests include horseback riding, gardening, skiing, hiking, music, and photography.

EMPLOYMENT HISTORY:

- Summer 1986 - Consultant, Small Business Development Center, U.S.U.
- Summer 1985 - Research Assistant, Political Science Dept., U.S.U.
- 1980 - 1985 - Research Technician I & II, Range Science Dept., U.S.U.
- 1977 - 1985 - Teaching Assistant, Range Economics, Range Science, Biology, U.S.U., W.S.U.
- 1975 - 1976 - Community Development Aide 4-H Programs, Los Alamos Cooperative Extension Service, New Mexico
- 1968 - 1974 - Small farmer, Oregon

AWARDS, FELLOWSHIPS, AND AFFILIATIONS:

- 1988 American Association of University Women Fellowship
- 1979-80 and 1985-86 Research Fellowship, Utah State University
- 1979 Outstanding Teaching Assistant Award, Washington State University
- 1979 Phi Kappa Phi

- Member:
- Society for Range Management
 - Western Agricultural Economics Association
 - Rural Sociological Society
 - National Wildlife Federation
 - The Nature Conservancy
 - American Farmland Trust
 - Agriculture, Food and Human Values Society
 - Human Dimensions in Wildlife Work Group

PUBLICATIONS:

- Jordan, L. A. and J. P. Workman. 1988. Deer and elk fee hunting opportunities in Utah: Economics and management. Submitted to the Wildlife Society Bulletin.
- Jordan, L. A. and J. P. Workman. 1989. Fee hunting opportunities for deer and elk in Utah: what they are and who provides them. Pages 242-261 in Multiple users - multiple products. Proc. of symposium. Soc. for Range Management Annual Meeting. Billings, MT.

PRESENTATIONS:

- Jordan, L. A. 1988. A sketch of fee hunting in Utah. Society for Range Management Utah Section Annual Meeting. St. George, Utah.
- Jordan, L. A. and J. P. Workman. 1988. Fee hunting opportunities on private land in Utah. Society for Range Management Annual Meeting. Corpus Christi, Texas. Poster.
- Jordan, L. A. and J. P. Workman. 1988. Fee hunting opportunities on private land in Utah. First International Wildlife Ranching Symposium. Las Cruces, New Mexico. Poster.
- Jordan, L. A. and J. P. Workman. 1988. Fee hunting opportunities on private land in Utah. Second Symposium on Social Science in Resource Management. Urbana-Champaign, Illinois. Poster.
- Jordan, L. A. 1988. Fee hunting for deer and elk on private land in Utah. National Association of Conservation Districts Public Lands, Pasture, and Range Committee Annual Meeting. Provo, Utah.
- Jordan, L. A., J. H. Richards, and M. M. Caldwell. 1983. The role of nonstructural carbohydrates in tolerance of herbivory. American Society of Plant Physiologists. Ft. Collins, Colorado. Poster.
- Presented programs to 4-H leaders, 4-H groups, and the public as part of my responsibilities as Community Development Aide, 4-H programs.