Hunter Access to Private Lands and Attitudes of Utah Landholders Toward Hunting

James R. Kitts
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HUNTER ACCESS TO PRIVATE LANDS AND ATTITUDES
OF UTAH LANDHOLDERS TOWARD HUNTING

by

James R. Kitts

A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Wildlife Science

Approved:

UTAH STATE UNIVERSITY
Logan, Utah
1975
ACKNOWLEDGMENTS

Completion of a task such as this is indeed satisfying, not just because it means the end of long hours of frustration, but mostly because it represents the completion of a series of difficult academic challenges. It is for the many challenges conquered with the assistance of others that I extend my gratitude.

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It seems inappropriate that a document such as this be completed without dedication. Therefore, I dedicate this to my wife JoAnn, my son David and all the remaining members of our families who offered encouragement to accept the challenges.
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ABSTRACT

Hunter Access to Private Land and Attitudes
Of Utah Landholders Toward Hunting

by

James R. Kitts, Doctor of Philosophy

Utah State University, 1975

Immediately following the 1971 upland game season a questionnaire booklet was mailed to 2076 Utah farmers and ranchers (landholders) in five southern and six northern counties. Approximately 50 percent were returned containing usable information.

Five categories of hunter access restriction were considered: 1) fee systems, 2) leases to private clubs, 3) pheasant hunting units, 4) posting "Hunting by Permission Only," and 5) posting "No Hunting" or "No Trespassing." Restriction of hunter access to private property occurred twice as frequently in northern counties as in southern counties. Nearly six of every ten northern landholders had an active hunter restriction program.

Sixteen demographic and attitude variables were compared with landholder restriction practices. Ten variables were significantly related to landholder restriction practice at the 90 percent level or higher. These relationships suggest the landholder's prime motivation for restricting hunter access was his
desire to protect his investment in buildings, equipment, livestock or crops.

Restriction practices compared between northern and southern landholders showed that stringent hunter restrictions resulted from concentrated hunter activity characteristic of densely populated, industrialized areas. Landholders, invited to suggest alternate conditions under which hunters could gain access to restricted land, pointed out that the single most important condition was for the hunter to request permission from the landholder to hunt.

Approximately 88 percent of northern and 91 percent of southern landholders favored the concept of hunting. A Likert five-point Attitude Index, used to assess landholders' attitudes toward hunting, showed landholders in northern industrial counties (Salt Lake, Utah, Weber) scored 39.9 of 55.0 possible points. Landholders in northern agricultural counties (Cache, Box Elder, Tooele) scored 40.9 points. Southern landholders scored 41.0 points. Students T-tests between landholder categories (H⁰₁ = μ₂ and α = 0.05) revealed no significant differences.

There was no significant relationship between a landholder's attitude score and his hunter restriction policy. Attitude toward hunting was important in determining by what methods landholders restricted hunter access. Landholders with low attitude scores (unfavorable or undecided) tended to post "No Hunting" or "No Trespassing." Those with favorable attitudes tended to use the "Hunt by Permission Only" restriction.
INTRODUCING THE PROBLEM

The Problem

Natural resource administrators and wildlife managers must respond to the changes occurring in our physical and social environments. For the future it will be necessary to expand the scope of our work to include investigations of biological problems for all animal species—not just game species. Scientists must be more aware of and prepared to cope with the social implications of consumptive and non-consumptive wildlife use (Poole, 1970). One of the most urgent problems is a constant reduction of wildland area open for public hunting and an increase in the size of the user population. Combs (1974, p. 15) elucidated two threats to the complacency of resource management agencies:

1) An almost arithmetical progression in the increase of hunting pressure.
2) The steady encroachment of so called "civilization" on wildlife habitat.

In 1963, approximately one-third of all families in the United States were interested in hunting (Agricultural Stabilization and Conservation Service, 1963). By 1970, only one household in five contained a hunter; but, the number of individual hunters rose by nearly 2 million (United States Department of the Interior, 1970).

Use of land for urban areas, highways, and other non-agricultural and non-recreational activities increased 24 percent from 1880 to 1950. Expectations are that it will continue to increase in accordance with the rise in human population.
density, affluence, and increased mobility. In 1970, the annual conversion of agricultural land occurring in the United States was: 1) 420,000 acres for urban development; 2) 160,000 acres for highways, roads and airports outside urban areas; 3) 420,000 acres for water reservoirs or flood control areas; 4) 150,000 acres for surface mining (either new strip mines or dumping areas) for a total of 1,150,000 acres (United States Department of Agriculture, 1971). In 1962, the Outdoor Recreation Resources Review Commission (ORRRC) estimated an annual conversion from agricultural to non-agricultural and urban land of 1 million acres; further, they predicted this trend would continue. The USDA figures substantiate the ORRRC prediction.

The Report of the Committee on North American Wildlife Policy (Allen, 1973, p. 171) contained an accurate and succinct appraisal of this problem:

Free public hunting has been an assumption with American outdoorsmen. In a sense the hunter has been subsidized by the landowner, who produces something that is common property and from which he may profit little, if at all. Yet access to private land will continue to be our great dependence in taking game crops. Maintaining relationships that will preserve the hunting privilege must be a longterm concern of sportsmen and administrators.

Hunters have been subsidized by landholders;* they have also received contributions to ease of participation in hunting from state and federal governments. State owned (or leased) and managed hunting areas provide vast acreage

*Landholders refers to farmers, ranchers and other individuals controlling large tracts of agricultural lands suitable for use as wildlife habitat.
available free or on a "low" user fee basis. Federally owned lands managed by
the United States Forest Service, Bureau of Land Management, Bureau of Recla-
mation, Fish and Wildlife Service and others also add millions of acres to lands
available to hunters either free or for modest user fees.

With the increasing price of rural land it seems evident that neither
federal agencies nor state resource management agencies will be able to purchase
sufficient property to continue the American tradition of open hunting for all who
wish to participate. Private landholders therefore become the focal point.

"Speaking nationally, the bulk of hunting is done on private lands." (Poole,
1971, p. 21)

Because of land-use and ownership patterns across the United States,
farmers, ranchers and rural residents controlling large tracts of land provide
85 percent of the wildlife habitat which produces 80 percent of the upland game
harvested (Kimball, 1962). Obviously, with a reduction in habitat through land
conversion, we suffer a reduction in numbers of individual animals as well as
numbers of wildlife species available for consumptive or non-consumptive use.
Furthermore, activity patterns of the user public are changing, due perhaps in
part to the lack of available private lands. As a result of the decreasing avail-
ability of huntable wildlands and the increasing number of hunters, game and the
privilege to hunt will cease to be "free" services of nature. Accompanying this
change will be an increase in landholder-sportsman conflict, especially in re-
gard to posting of private land against hunter trespass.
There is a substantial amount of data available on economic contributions of hunting. Coutre (1954) described the economics of hunting in Massachusetts. White (1955), Utah Department of Fish and Game (1957), and Matson (1964) followed with studies involving analyses of economics of hunting in New Hampshire, Utah and South Dakota. All the studies demonstrate sport hunting activities annually generate many millions of dollars in revenues.

Hunters themselves have been the focus for several descriptive studies. The most notable of which were performed by Peterle (1961) in a study of Ohio sportsmen, and Klessig and Hale (1972) who profiled Wisconsin hunters.

Studies of landholder-sportsman problems have been conducted primarily in eastern portions of the United States. Whitesell (1952) studied farmer-hunter problems in Ohio. Results from his work indicated a major source of these conflicts stemmed from lack of available unposted land for hunting; hunters felt obtaining permission to hunt on private land was unnecessarily arduous. Durell (1967) focused his attention on problems of decreasing popularity of hunting in Kentucky. This was basically a descriptive work and nothing conclusive was published with regard to the decline in hunting interest. The findings of Slocum and Empey (1954) reinforced earlier speculation by wildlife managers that misunderstandings between landholders and sportsmen might be avoided if hunters would take positive, responsible action to protect landholders and their property from damages. Johnson (1966) investigated some "... organized efforts to improve landuser-sportsman relations for the purpose of maintaining public upland game hunting." His was the first study of its kind in Utah, and acknowledged
that efforts were being made to alleviate existing problems. Utah's Triangle Program and the Pheasant Hunting Unit concept were effective programs, but additional effort from sportsmen to accept responsibility for protection of farm property was needed.

The problem of landholders restricting hunters from private land was investigated by Barclay (1965) and Waldbauer (1966). Both investigators worked in high density eastern states--Pennsylvania and New York respectively. Barclay's work indicated a direct relationship between posting against access and educational level of the landholder. Waldbauer found no such relationship among New York respondents. There, restriction of hunters was more in response to protection of property and control over the number of hunters using the property. McIntosh (1967) studied posting of private lands in West Virginia, and extended his work into the area of "... landholder attitudes regarding posting, hunting fees, and the hunter." Landholders in West Virginia viewed posting as the least desirable method for controlling hunting activity; they accepted most hunters as responsible individuals and were not particularly favorable toward charging fees to hunt on private lands.

These studies not withstanding, Poole (1971, p. 22) was prompted to comment:

Actually, we know relatively little about the landowner, why he does or does not permit hunting or what can be done to encourage him to maintain or plant wildlife cover. ... Researchers have chosen largely to focus on animal biology.
As a result of this observation and because nearly all previous studies were conducted in eastern states, the Wildlife Management Institute and the National Rifle Association of America funded this investigation. Emphasis for the project was on problems associated with restricting hunter access to private land. In addition, the research was performed in a low human density area.

Limitations and Objectives

In a study of this nature, the spectrum of topics for inquiry is virtually limitless. A review of available literature showed vacancies, the filling of which would provide useful information for resource management agencies. This was an exploratory study which considered associations between (1) demographics and restriction, (2) demographics and attitude toward hunting, and (3) attitude toward hunting and restriction of hunters from private property. Attitude intensity was not investigated.

Identification of conditions under which lands could be opened for public hunting was based on landholder responses to hypothetical situations. Basic assumptions associated with analysis of these responses were (1) landholders responded in a truthful manner, (2) responses were consistent with the landholders' best interests and the norms of their reference group (e.g. Utah farmers and ranchers). Interpretation of data beyond this could lead to spurious conclusions.

Six northern and five southern Utah counties were selected for study (Figure 1). Northern counties were Salt Lake, Weber, Utah, Cache, Box
Figure 1. Counties of Utah in which the study was conducted.
Elder, and Tooele. Southern counties selected were Washington, Wayne, Piute, Iron, and San Juan.

Pretesting was limited to landholders in Uintah and Davis counties while the population for final testing was composed of landholders from the 11 counties previously mentioned. Sample size for the final test represented approximately 75 percent of the agricultural landholders within selected counties and 14 percent of all Utah landholders.

To permit maximum application of the findings, landholders from urbanized and rural counties were contacted. Additionally, they were selected from areas traditionally exhibiting the heaviest and lightest upland bird hunting pressures. It should not be assumed that the findings will necessarily apply to similar areas elsewhere in the United States. This was not the major intent. However, extrapolation may be feasible and may serve the welfare of resource managers outside Utah.

The objectives of this study were:

1. To assess the availability of private land in Utah for upland bird hunting.

2. To describe and compare the demographic characteristics of Utah landholders as they affect hunter restriction policies.

3. To determine Utah landholder attitudes toward hunting and relate these to their demographics and hunter restriction policies.

4. To identify conditions under which Utah landholders would make more land available for public hunting.
**Attitude Assessment Theory**

Debates among psychologists and sociologists concerning the concept of attitude have been waged for many decades. Few social-psychological concepts have had as much influence on the direction of research as has this concept. Carpenter (1973) gives an excellent review of the history of the attitude concept. Perhaps fervor of the debate stems from basic confusion created by researchers not agreeing on a precise definition of attitude. Young and Schmid (1966, p. 351) observe:

> In spite of the extraordinary amount of effort devoted to this subject, "attitudes" as a concept in sociology and social psychology possesses no unanimity of meaning. To be sure many verbal definitions have been formulated, but generally speaking they lack clarity and precision. Moreover, such definitions have been given only scant consideration in attitude measurement.

However, definitions are interchangeable in relation to measuring attitude and testing hypotheses (Rokeach, 1968). For the purpose of this study, attitude is defined as—a predisposition to behave positively or negatively toward an object, concept, or situation. This definition has been modified from one proposed by Krech, Crutchfield and Ballachey (1962).

Several scaling techniques that permit quantitative measurement of attitude are available. Techniques known as "interval" scales were first introduced by Thurstone (1928). This group of techniques is useful for assessing intensity of attitude. Construction of these scales is based on median values
assigned by a panel of "judges." The process has limited value here and is tedious and time consuming.

Likert (1932) designed a technique of attitude measurement based on the summation of ratings from a list of "attitude statements." Each statement is rated by the respondent on a 5 point scale and these individual ratings are summed to obtain a single score. The purpose of this method is not to measure attitude intensity, rather to facilitate ranking (ordering) individuals in a test audience based upon self evaluation of attitude. This system had several advantages pertinent to this study:

1. It provided a scaling technique easy to construct and administer.

2. The statements used were selected by statistical processes of factor and item analyses using data from a subsample of the test population.

3. Since the study was not designed to gauge attitude intensity—only direction—this was the most suitable ordinal technique.

4. Respondents rated themselves.

**Hypotheses**

Hypotheses considered in this study were:

1. Significant relationships exist between restriction practices of landholders and selected demographic and behavioral characteristics.

2. Utah landholders have an attitude toward hunting that is predominantly favorable.
3. There is a significant relationship between landholder attitude toward hunting and restriction of hunters from private property.

4. Significant associations exist between landholder attitude toward hunting and selected demographic and behavioral characteristics.
PROCEDURES

Data Collections

Site selection

All counties, including those for pretest, were chosen by ordering the counties according to mean hunting pressure (1967-1969) expressed as hunter days, for each of the five most popular upland birds (pheasant, mourning dove, chukar, forest grouse, and sage grouse). Arbitrary scores were assigned to each of the counties according to the county's position within each of the five upland bird categories. These scores were then totaled by county and the totals considered as hunting pressure indices. Those counties having the highest (northern counties) and lowest (southern counties) most nearly matched indices were selected for the study. All calculations for hunting pressure were based on work by Nish (1970).

Pretesting the questionnaire

After considerable investigation, a mail questionnaire was selected as the most effective survey tool. Funding, logistics and training interview personnel appeared formidable obstacles to conducting an interview survey.

A pretest mail questionnaire containing a Likert five-point Attitude Index and questions concerned with posting private property, land use, and various demographic characteristics was distributed in August, 1971. The pretest
sample consisted of 100 landholders each from Uintah County, a rural, agriculturally oriented county, and Davis County, an urban, industrially oriented county. One follow-up letter was mailed 2 weeks after the questionnaire.

Data from the pretest Likert Index were subjected to factor and item analyses as checks for internal consistency (Oppenheim, 1966). Only those statements which grouped under the hunting factor with correlation coefficients of 0.90 or better were retained for the attitude index in the test questionnaire.

The remainder of the pretest questionnaire was analyzed to determine:
1) the completeness of the data; 2) appropriateness of individual questions;
3) technical completeness of each question; 4) continuity.

Application of the questionnaire

A 75 percent sample of landholders was selected from each county using a list of landholders and a standard table of random numbers (Ostle, 1963). The lists of landholders from which the samples were taken were provided by the county agents from the 11 counties involved. These lists were compiled by the Utah Extension Service at Utah State University. Lists included only active farmers and ranchers, not absentee owners.

The final test instrument was a nine page, 5 x 8 inch booklet. This booklet, along with a cover letter explaining the purpose of the project and a postpaid return envelope, was sent to each selected landholder immediately following the close of the 1971 Utah pheasant season. A follow-up letter was mailed to non-respondents 2 weeks later. Immediately following the 1972 New Year holiday,
a second mailing of the questionnaire was made to non-respondents with a revised cover letter and post-paid envelope. This was followed in 10 days by a final follow-up letter. Copies of the booklet, original cover letter and first follow-up letter are included as Appendices A and B.

A modified Likert Attitude Index was used to rank individuals according to their attitudes toward hunting. The index was a five-point scale with statement scores ranging from 1-5. A landholder with a completely unfavorable attitude toward hunting would score 11 points, while a landholder with a completely favorable attitude would score 55 points. Individuals undecided in regard to hunting would score 33 points. Additional components of the booklet included sections concerning posting private property against trespass and/or hunting, land use and social demographics.

To collect data as a test of change in attitude over time, a second questionnaire was mailed 3 weeks prior to the opening of the 1972 upland game season to all landholders responding to the original booklet. This was a one-page questionnaire containing a Likert five-point Attitude Index utilizing the same statements as in the original booklet but with a slightly different order and with the addition of several camouflage statements. Again, a cover letter was provided explaining the purpose of the questionnaire, and a post-paid envelope was furnished. No follow-up letter was used with this second survey, and no returns were accepted after the opening day of the 1972 upland game season.
Interviews

Forty-eight personal interviews (5 percent of the non-respondents) were conducted with landholders in the six northern counties. Landholder names were randomly selected from the lists of non-respondents to the test questionnaire booklet. Data from these interviews were analyzed as a check for non-response bias.

Data Analysis

Data were coded, transcribed to IBM data cards and analyzed with a Burroughs 2400 Computer. Analyses were accomplished using the Statistical Package for the Social Sciences, hereafter referred to as SPSS (Nie, Bent and Hull, 1970). Analyses included: 1) categorical percentages, 2) means and standard deviations, 3) Students T-test, 4) contingency tables and independence Chi-square, and 5) Kendall tau correlation to compare attitude data with demographics.
RESULTS

Questionnaire Returns and Non-response Bias

The original questionnaire for this study was distributed to 2,076 Utah landholders in six northern and five southern counties. Approximately 53 percent (1,098 questionnaires) were returned completed - 1,039 of which contained usable information.

Non-response bias is frequently encountered in mail questionnaire surveys. The basis is that people solicited who do not have a relatively strong commitment to the survey topic tend to respond in disproportionate numbers. Generally their feelings are under represented in the sample (Suchman, 1962). For this reason a subsample of non-respondents was selected at random and interviewed. The 48 individuals interviewed represented 5 percent of the non-respondent audience.

Continuous data characteristics

Interviewees were asked to complete the same Likert five-point Attitude Index as included in the questionnaire. Data concerning the number of years of farm experience was also collected in the interview. Comparison of the mean values for these variables were conducted using Students T-tests.

The average attitude score from the questionnaire audience was 40.4 while the score from the interview audience was 39.0. There was no statistical
difference between these scores ($\alpha = 0.05$, $F = 0.576$, $t = 1.88$). A test for
difference of means for years of farm experience was also not significant at the
95 percent level ($F = 1.68$, $t = 1.78$) even though the interview audience averaged
8.8 years more experience (49.5 years for interview and 40.7 years for question-
aire).

**Categorical data characteristics**

Data concerning 1) amount of land controlled, 2) education completed,
3) restriction policy, 4) hunter interest classification were collected in categor-
ical form. Tests of these variables between the interview and questionnaire
respondents were performed using Goodness-of-fit Chi-square according to the
hypothesis: Distribution of interview data occur according to the proportions
established by questionnaire responses.

The hypothesis was rejected for "Amount of Land Controlled" ($x^2_{0.95(7)} =
14.06$ since the calculated $x^2 = 18.11$). Interview respondents controlled slightly
less acreage than questionnaire respondents. The hypothesis was also rejected
for "Education Completed" ($x^2_{0.95(4)} = 9.48$ since the calculated $x^2 = 12.73$).
In this instance, interviewees had completed less schooling than questionnaire
respondents. For all other factors compared, these groups were statistically
equal.
Availability of Land and Restrictions to Availability

Communication between landholders and resource managers

Communication between the Utah Division of Wildlife Resources and landholders regarding the problems of maintaining public access to private land was minimal during the 5 years preceding this study (Table 1). Agency personnel in the southern counties sought landholder assistance more frequently than personnel in northern counties. Only 6.7 percent of the landholders sampled from all 11 counties had been contacted. Of all the counties, the northern urban counties received the least attention with 6.1 percent of the landholders having been contacted.

Restriction methods used by landholders

For survey purposes, restrictions that affected hunter access to private lands were divided into six categories. These were: fee systems, pheasant hunting units, leases to private clubs, posting "No Hunting" or "No Trespassing," posting "Hunting by Permission Only," and land open with no restrictions. For data analyses, the first three categories involving the pay-to-hunt concept were grouped as one category entitled "Fee Systems." The remaining three categories were analyzed as they appear above.

The subcategory "pheasant hunting unit" contained approximately 92 percent of the northern landholders and 96 percent of the southern landholders within the category "Fee Systems." The percentage of northern landholders leasing to
Table 1. Responses of Utah landholders regarding the frequency with which resource managers solicited suggestions about keeping private land open for public hunting (1966-1971).

<table>
<thead>
<tr>
<th>Frequency of Requests</th>
<th>Property Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Northern Rural Counties</td>
</tr>
<tr>
<td>Often each year</td>
<td>0.6%</td>
</tr>
<tr>
<td>Few times/year</td>
<td>1.4%</td>
</tr>
<tr>
<td>Few times/5 years</td>
<td>4.7%</td>
</tr>
<tr>
<td>Never</td>
<td>93.3%</td>
</tr>
<tr>
<td>Totals</td>
<td>100.0%</td>
</tr>
<tr>
<td>n</td>
<td>298</td>
</tr>
</tbody>
</table>
private hunting clubs was 7 percent, and of southern landholders, it was 3 percent. The remaining 1 percent included landholders utilizing such devices as trespass fees, parking fees, and shooting preserves.

Restrictions of hunter access to private property occurred twice as frequently in northern counties as in southern counties. In terms of hunter/landholder contacts, this translated to 6 of every 10 northern county landholders had an active hunter restriction program. Of these 6, 4 were involved in some type of fee collection system, 1 posted against trespass of hunting, and 1 expected the hunter to request permission to hunt.

Reasons for restricting hunter access to private land

During the pretesting stage of this study, landholders were asked to list the reasons they restricted hunter access to their properties. These responses were then coded and used in the final questionnaire as a closed-end question. The five categories listed in Table 2 are those derived from pretest responses.

Although no category received a majority "Yes" response, it is obvious landholders feel they must protect their properties and limit abusive or inconsiderate acts from hunters. This rationale applies to northern and southern landholders. In addition, northern landholders consider sheer numbers of hunters a problem. Southern landholders do not recognize numbers of hunters as a problem.
Table 2. Major reasons why (Utah) landholders restrict hunter access to their lands

<table>
<thead>
<tr>
<th>Reasons for Restricting Hunters</th>
<th>Landholders Responding &quot;Yes&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Northern</td>
</tr>
<tr>
<td>Upland bird hunters are destructive to private property</td>
<td>42.8</td>
</tr>
<tr>
<td>Upland bird hunters are abusive and inconsiderate</td>
<td>32.2</td>
</tr>
<tr>
<td>Upland bird hunters are careless with firearms</td>
<td>22.0</td>
</tr>
<tr>
<td>To control the number of hunters</td>
<td>24.3</td>
</tr>
<tr>
<td>Neighbor landholders wanted me to</td>
<td>4.7</td>
</tr>
</tbody>
</table>
Landholder characteristics influencing restriction of hunters from private land

General characteristics of farmers

Location of property. Of landholders restricting hunter access, 87 percent controlled land in northern Utah counties (Table 3). Approximately 84 percent of these restricted access by posting "No Hunting" or "No Trespassing."

The hypothesis ($H_0$: Restriction of hunter access to private land was independent of location of land) was rejected ($X^2_{0.999(1)} = 10.8$). Compared to the expected results, 12 percent more northern landholders and 41 percent fewer southern landholders restricted access to their properties.

Education completed. Survey data indicated that 33 percent of northern Utah landholders were high school graduates. A higher percentage of southern landholders attended college than did northern landholders (35.6 and 27.9 respectively). The total percentages were quite consistent between landholder groups except for reversals noted for "High School" and "Attended College" categories (Table 4).

For both landholder groups, the test of the hypothesis ($H_0$: Restriction of hunters was independent of landholder educational level) was not significant ($X^2_{0.90(5)} = 9.24$), and failed rejection for northern and southern landholders. Restriction of hunter access is independent of a landholder's educational level.

Alternate employment status. Of the northern landholders sampled, 51.0 percent listed farming or ranching as their only occupation. The southern
Table 3. Relationship between restricting hunter access and the location of landholder's property.

<table>
<thead>
<tr>
<th>Restriction Methods</th>
<th>Landholder Property Location</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Northern Counties</td>
<td>Southern Counties</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%*</td>
<td>n</td>
<td>%*</td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>97</td>
<td>84</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Fee System</td>
<td>338</td>
<td>90</td>
<td>38</td>
<td>10</td>
</tr>
<tr>
<td>Permission Only</td>
<td>75</td>
<td>79</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>275</td>
<td>65</td>
<td>147</td>
<td>35</td>
</tr>
<tr>
<td>Totals</td>
<td>785</td>
<td>78</td>
<td>223</td>
<td>22</td>
</tr>
</tbody>
</table>

Chi-square = 68.1  \( df = 1 \)

* For this and succeeding tables unless otherwise indicated the percentages are derived from contingency table displays and are horizontally additive to 100 percent.

n Indicates sample size.

df Indicates degree of freedom.
Table 4. Hunter access restrictions in relation to level of education completed by landholders.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Grade School</td>
<td>% Junior High</td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>7.6 9.8 35.9 2.2</td>
<td>11.8 5.9 29.4 0.0</td>
</tr>
<tr>
<td>Fee System</td>
<td>6.3 15.2 32.8 4.5</td>
<td>5.3 13.2 31.6 0.0</td>
</tr>
<tr>
<td>Permission Only</td>
<td>2.9 10.0 32.9 2.9</td>
<td>5.6 0.0 22.2 5.6</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>6.7 13.3 32.2 4.8</td>
<td>8.2 12.3 24.0 4.1</td>
</tr>
<tr>
<td>Totals</td>
<td>6.3 13.4 33.0 4.2</td>
<td>7.8 11.0 25.6 3.2</td>
</tr>
<tr>
<td>Chi-square = 2.2 df = 5</td>
<td></td>
<td>Chi-square = 6.07 df = 5</td>
</tr>
</tbody>
</table>
landholders listing farming or ranching as their only occupation amounted to 58.8 percent of the sample.

Percentage distribution of the remaining landholders by alternate occupation is listed in Table 5. Effects of urbanization on the northern counties was reflected in higher percentages of landholders employed as service workers, craftsmen, technicians, professionals and a much reduced percentage of proprietors (small, family-owned businesses).

Differences in restriction policy with regard to alternate employment status were especially apparent between landholder groups in the categories of "No Restrictions" and "No Hunting" or "No Trespassing." The single most striking relationship occurred for southern landholders where 72.2 percent posted their lands "No Hunting" or "No Trespassing" and claimed no alternate occupation (Table 6).

The test of the hypothesis \( H_0 \) : Restriction of hunters was independent of landholder alternate employment) was not significant for southern or northern landholders \( (X^2_{0.90(3)} = 6.25) \). Therefore, the hypothesis for both landholder groups failed rejection. Restriction of private property to hunters was independent of alternate employment status.

Farm background

Years of farm experience. A depressed response to the farm experience category "11-20 Years" is shown for both the northern and southern landholder groups (Table 7). This may be due to a movement of young men off farms and
Table 5. Distribution of Utah landholders according to their alternate occupations.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Landholder Groups</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Northern</td>
<td>% Southern</td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>9.4</td>
<td>7.7</td>
<td></td>
</tr>
<tr>
<td>Service Worker</td>
<td>7.3</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Operative</td>
<td>11.2</td>
<td>14.3</td>
<td></td>
</tr>
<tr>
<td>Craftsmen</td>
<td>9.4</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>Technician</td>
<td>6.6</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>7.3</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Proprietor</td>
<td>6.1</td>
<td>19.8</td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>8.6</td>
<td>9.9</td>
<td></td>
</tr>
<tr>
<td>Student/Military</td>
<td>34.1</td>
<td>34.1</td>
<td></td>
</tr>
</tbody>
</table>

100.0   100.0
Table 6. Restriction of private property in relation to landholders' alternate employment status.

<table>
<thead>
<tr>
<th>Restriction Methods</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Yes</td>
<td>% No</td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>53.1</td>
<td>46.9</td>
</tr>
<tr>
<td>Fee System</td>
<td>47.9</td>
<td>52.1</td>
</tr>
<tr>
<td>Permission Only</td>
<td>39.7</td>
<td>60.3</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>51.5</td>
<td>48.5</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>49.0</td>
<td>51.0</td>
</tr>
</tbody>
</table>

Chi-square = 4.6, df = 3

Chi-square = 1.39, df = 3
Table 7. Amount of farm experience as related to hunter access restrictions.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
<th>Chi-square</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%1-10</td>
<td>%11-20</td>
<td>%21-30</td>
<td>%31-40</td>
</tr>
<tr>
<td>No Hunt or No Trespass</td>
<td>9.3</td>
<td>5.2</td>
<td>9.3</td>
<td>25.8</td>
</tr>
<tr>
<td>Fee System</td>
<td>12.1</td>
<td>4.1</td>
<td>10.9</td>
<td>16.9</td>
</tr>
<tr>
<td>Permission Only</td>
<td>17.3</td>
<td>4.0</td>
<td>8.0</td>
<td>24.0</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>10.5</td>
<td>4.0</td>
<td>9.5</td>
<td>21.8</td>
</tr>
<tr>
<td>Totals</td>
<td>11.7</td>
<td>4.2</td>
<td>9.9</td>
<td>20.4</td>
</tr>
</tbody>
</table>

Chi-square = 9.3  df = 12  Chi-square = 2.14  df = 4
ranches to more urbanized areas. The remainder of the categories are quite consistent between the two landholder groups. There was a rather distinct increase in the percentages of landholders between experience categories "21-30 Years," "31-40 Years," and "41-up." This points to an increasing average (X) age for Utah landholders. For both northern and southern landholders I failed to reject the hypothesis (H₀ : Restriction to hunters was independent of amount of landholder farm experience) (X²₀.₉₀ (12) = 18.5 for northern landholders and X²₀.₉₀(4) = 7.78 for southern landholders). Restriction of hunter access to private property was not influenced by the length of farm experience of landholders.

Agricultural acreage controlled. The distribution pattern of acreage controlled by landholders was of interest because comparison of the "20-60 Acres" and "1201-up Acres" categories (Table 8) revealed a nearly complete reversal between northern and southern landholders. Northern landholders who controlled smaller parcels of agricultural land had land under more severe restrictions than did southern landholders.

The hypothesis (H₀ : Restriction of hunters was independent of agricultural acreage controlled) was rejected for northern landholders (X²₀.₉₉₉(18) = 42.3). For southern landholders, the hypothesis failed to be rejected (X²₀.₉₀(7) = 12.0). Restriction of hunter access by northern Utah landholders was related to the acreage controlled, and the smaller the acreage, the more restrictive landholders were.
Table 8. Restriction of private property relative to agricultural acreage controlled by landholders.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>%20-60</th>
<th>%61-120</th>
<th>%121-200</th>
<th>%201-400</th>
<th>%401-800</th>
<th>%801-1200</th>
<th>%1201-up</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hunting or No Trespassing</td>
<td>43.6</td>
<td>11.7</td>
<td>11.7</td>
<td>7.4</td>
<td>6.4</td>
<td>6.4</td>
<td>12.8</td>
<td>94</td>
</tr>
<tr>
<td>Fee System</td>
<td>25.9</td>
<td>21.8</td>
<td>17.5</td>
<td>15.7</td>
<td>8.8</td>
<td>2.1</td>
<td>8.8</td>
<td>331</td>
</tr>
<tr>
<td>Permission Only</td>
<td>11.1</td>
<td>19.4</td>
<td>11.1</td>
<td>13.9</td>
<td>8.4</td>
<td>25.0</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>No Restrictions</td>
<td>30.6</td>
<td>15.3</td>
<td>15.3</td>
<td>14.2</td>
<td>8.6</td>
<td>4.1</td>
<td>11.9</td>
<td>268</td>
</tr>
<tr>
<td>Totals</td>
<td>28.4</td>
<td>18.0</td>
<td>15.4</td>
<td>13.5</td>
<td>8.9</td>
<td>3.9</td>
<td>11.9</td>
<td>765</td>
</tr>
<tr>
<td>Chi-square = 51.9</td>
<td>df = 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Southern Landholders

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>%20-60</th>
<th>%61-120</th>
<th>%121-200</th>
<th>%201-400</th>
<th>%401-800</th>
<th>%801-1200</th>
<th>%1201-up</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hunting or No Trespassing</td>
<td>5.9</td>
<td>5.9</td>
<td>5.9</td>
<td>41.2</td>
<td>11.8</td>
<td>11.8</td>
<td>17.6</td>
<td>17</td>
</tr>
<tr>
<td>Fee System</td>
<td>13.2</td>
<td>21.1</td>
<td>7.9</td>
<td>13.2</td>
<td>13.2</td>
<td>10.5</td>
<td>21.1</td>
<td>38</td>
</tr>
<tr>
<td>Permission Only</td>
<td>5.6</td>
<td>5.6</td>
<td>22.2</td>
<td>16.7</td>
<td>11.1</td>
<td>11.1</td>
<td>27.8</td>
<td>18</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>16.6</td>
<td>13.8</td>
<td>6.9</td>
<td>17.9</td>
<td>9.0</td>
<td>6.9</td>
<td>28.9</td>
<td>145</td>
</tr>
<tr>
<td>Totals</td>
<td>14.2</td>
<td>13.8</td>
<td>8.3</td>
<td>18.8</td>
<td>10.1</td>
<td>8.3</td>
<td>26.6</td>
<td>218</td>
</tr>
<tr>
<td>Chi-square = 6.24</td>
<td>df = 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Agricultural crop produced. Landholders were requested to indicate types of crops raised. Their choices were hay, pasture, cannery crops, cereal and/or feed grain, silage, produce, sugar beets and miscellaneous. A considerably higher percentage of southern than northern landholders raised hay (20.6 percent and 9.7 percent respectively). Livestock grazing was also more prominent in southern counties—36.3 percent in southern counties compared to 24.2 percent in northern counties. Landholders in northern counties emphasized crop production especially in areas of cannery and silage, cereal grains, sugar beets and fruits. Approximately 90 percent of the landholders responding to the miscellaneous category specified fruit orchards; another 2 percent listed Christmas trees; and 1 percent indicated ornamental nursery. The remaining 7 percent responding to miscellaneous did not specify their crop (Table 9).

The test of the hypothesis \( H_0: \) Restriction of hunters was independent of agricultural crop produced) for each landholder group was not significant. The hypothesis for the northern and southern landholders failed rejection \( \chi^2_{0.90}(3) = 6.25 \).

Behavioral features

Neighbor landholder restriction practices. It is a generally accepted sociological principle that as humans we respond in relation to reference group pressures; in others, they may be subtle.

A positive relationship existed between respondents' restriction methods and whether or not his neighbors restricted hunters from their property (Table 10).
Table 9. Comparison of hunter access restrictions and types of crops produced by landholders.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>% Hay</th>
<th>% Grazing</th>
<th>% Produce</th>
<th>% Cereal</th>
<th>% Misc.</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hunting or No Trespassing</td>
<td>6.2</td>
<td>20.6</td>
<td>4.1</td>
<td>8.4</td>
<td>60.7</td>
<td>97</td>
</tr>
<tr>
<td>Fee System</td>
<td>10.0</td>
<td>12.4</td>
<td>4.4</td>
<td>8.3</td>
<td>64.9</td>
<td>338</td>
</tr>
<tr>
<td>Permission Only</td>
<td>4.0</td>
<td>21.3</td>
<td>1.3</td>
<td>9.3</td>
<td>64.1</td>
<td>75</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>12.0</td>
<td>14.9</td>
<td>3.6</td>
<td>9.4</td>
<td>60.1</td>
<td>275</td>
</tr>
<tr>
<td>Totals</td>
<td>9.7</td>
<td>24.2</td>
<td>3.8</td>
<td>8.8</td>
<td>62.5</td>
<td>785</td>
</tr>
</tbody>
</table>

Chi-square = 1.6  df = 3

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>% Hay</th>
<th>% Grazing</th>
<th>% Produce</th>
<th>% Cereal</th>
<th>% Misc.</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hunting or No Trespassing</td>
<td>22.2</td>
<td>27.8</td>
<td>0.0</td>
<td>0.0</td>
<td>50.0</td>
<td>18</td>
</tr>
<tr>
<td>Fee System</td>
<td>15.8</td>
<td>36.8</td>
<td>0.0</td>
<td>0.0</td>
<td>47.4</td>
<td>38</td>
</tr>
<tr>
<td>Permission Only</td>
<td>30.0</td>
<td>30.0</td>
<td>5.0</td>
<td>0.0</td>
<td>35.0</td>
<td>20</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>20.4</td>
<td>38.1</td>
<td>0.7</td>
<td>6.1</td>
<td>34.7</td>
<td>147</td>
</tr>
<tr>
<td>Totals</td>
<td>20.6</td>
<td>36.3</td>
<td>0.9</td>
<td>4.0</td>
<td>38.1</td>
<td>223</td>
</tr>
</tbody>
</table>

Chi-square = 5.34  df = 3
Table 10. Restriction of private property in relation to adjacent neighbor's restriction policies.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%All Do</td>
<td>%Some Do</td>
</tr>
<tr>
<td>No Hunting or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Trespassing</td>
<td>22.9</td>
<td>75.0</td>
</tr>
<tr>
<td>Fee System</td>
<td>23.1</td>
<td>67.7</td>
</tr>
<tr>
<td>Permission Only</td>
<td>33.8</td>
<td>64.9</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>5.2</td>
<td>82.0</td>
</tr>
<tr>
<td>Totals</td>
<td>17.9</td>
<td>72.0</td>
</tr>
</tbody>
</table>

Chi-square = 62.6  df = 6

Chi-square = 9.78  df = 2
For both groups tested, the hypothesis \( H_0 : \text{Restriction of hunters was independent of neighbors restriction policy} \) was rejected (for northern landholders the value exceeded \( \chi^2_{0.999(6)} = 22.5 \), and for southern landholders the value exceeded \( \chi^2_{0.99(2)} = 9.21 \)). Thus, landholders were more likely to restrict hunter access when their neighbors did.

**Membership in agricultural and/or sportsman groups.** Total participation in agricultural organizations was 63.1 percent for northern landholders and 71.4 percent for southern landholders (Table 11). The lowest percentage of participation for both landholder groups occurred in the sportsman category. Southern landholders had a low rate—approximately 2 landholders out of 100 were members of a sportsmans organization within the past 5 years.

Those southern landholders not restricting hunter access had the lowest percentage of participation in either agricultural or sportsmans groups. Landholders restricting access by posting their property "No Hunting" or "No Trespassing" had the highest participation rates in agricultural groups (88.2 percent). Only 5.9 percent were non-participants in either type of organization.

In contrast, those northern landholders who restricted access through posting "No Hunting" or "No Trespassing" had the highest non-participation percentages (28.9 percent). They also had the lowest percentage of members in agricultural organizations (60.8 percent).

The hypothesis \( H_0 : \text{Restriction of hunters was independent of membership in an agricultural or sportsmans group} \) was not rejected for northern landholders, but for southern landholders \( \chi^2_{0.90(3)} = 6.25 \) the hypothesis was rejected.
Table 11. Restriction of private property compared with landholder experiences as members of agricultural and/or sportsmans groups.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%Agri.</td>
<td>%Sport</td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>60.8</td>
<td>4.1</td>
</tr>
<tr>
<td>Fee System</td>
<td>61.2</td>
<td>4.4</td>
</tr>
<tr>
<td>Permission Only</td>
<td>73.0</td>
<td>4.1</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>63.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Totals</td>
<td>63.1</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Chi-square = 1.9  df = 3  Chi-square = 7.58  df = 3
Office held in agricultural and/or sportsman groups. Participation in an organization as an officer was consistently higher for southern landholders than for northern landholders in all categories of restriction (Table 12). The most obvious disparity between landholder groups occurred in the restriction category labeled "No Hunting or No Trespassing" where northern landholders showed 73.2 percent non-participation.

The hypothesis ($H_0$: Restriction of hunters was independent of affiliation with agricultural or sportsman groups as an officer) was rejected for northern landholders ($X^2_{0.99(3)}=11.3$), and failed rejection for southern landholders ($X^2_{0.99(3)}=6.25$). Northern landholders who served as officers tended to be less restrictive toward hunters than those who had not been officers.

Hunting participation

Hunting regulation enforcement. A slightly higher percentage of southern landholders indicated they felt the Utah Division of Wildlife Resources was doing a "Good" job enforcing hunting regulations during the upland bird season. Northern landholders were nearly twice (1.8 times) as apt to select the "Poor" or "Terrible" categories (Table 13) than were southern landholders. For both groups of landholders the hypothesis ($H_0$: Restriction of hunters was independent of landholder opinion toward regulation enforcement) was rejected ($X^2_{0.995(12)}=26.2$ for northern landholders and $X^2_{0.995(6)}=18.5$ for southern landholders). Opinion about hunting regulation enforcement influenced restriction policy.
Table 12. Restricting private property in relation to the experience of landholders as officers of agricultural and/or sportsman groups.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>Northern Landholders Experience</th>
<th>Southern Landholders Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%Yes</td>
<td>%No</td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>26.8</td>
<td>73.2</td>
</tr>
<tr>
<td>Fee System</td>
<td>45.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Permission Only</td>
<td>50.7</td>
<td>49.3</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>41.5</td>
<td>58.5</td>
</tr>
<tr>
<td>Totals</td>
<td>42.0</td>
<td>58.0</td>
</tr>
</tbody>
</table>

Chi-square = 12.76  
Chi-square = 1.19  

df = 3  

df = 3
Table 13. Hunter access restrictions relative to landholder attitudes toward enforcement of hunting regulations.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>%Excellent</th>
<th>%Good</th>
<th>%Undecided</th>
<th>%Poor</th>
<th>%Terrible</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Landholders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>3.2</td>
<td>14.9</td>
<td>43.6</td>
<td>21.3</td>
<td>17.0</td>
<td>94</td>
</tr>
<tr>
<td>Fee System</td>
<td>3.4</td>
<td>33.5</td>
<td>27.4</td>
<td>25.8</td>
<td>9.8</td>
<td>325</td>
</tr>
<tr>
<td>Permission Only</td>
<td>4.1</td>
<td>28.4</td>
<td>23.0</td>
<td>33.8</td>
<td>10.8</td>
<td>74</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>3.3</td>
<td>24.5</td>
<td>37.2</td>
<td>25.3</td>
<td>9.7</td>
<td>269</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>3.4</td>
<td>27.6</td>
<td>32.3</td>
<td>25.9</td>
<td>10.8</td>
<td>762</td>
</tr>
<tr>
<td>Chi-square = 27.4 df = 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Landholders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>0.0</td>
<td>17.6</td>
<td>35.3</td>
<td>35.3</td>
<td>11.8</td>
<td>17</td>
</tr>
<tr>
<td>Fee System</td>
<td>5.4</td>
<td>24.3</td>
<td>48.6</td>
<td>16.2</td>
<td>5.4</td>
<td>37</td>
</tr>
<tr>
<td>Permission Only</td>
<td>0.0</td>
<td>25.0</td>
<td>35.0</td>
<td>15.0</td>
<td>25.0</td>
<td>20</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>4.2</td>
<td>39.3</td>
<td>42.1</td>
<td>10.3</td>
<td>4.1</td>
<td>145</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>3.7</td>
<td>33.8</td>
<td>42.0</td>
<td>13.7</td>
<td>6.8</td>
<td>219</td>
</tr>
<tr>
<td>Chi-square = 20.32 df = 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Management of upland bird populations. Both landholder groups showed a high degree of uncertainty as to the effectiveness of management of upland bird populations by the Utah Division of Wildlife Resources. However, when total group opinions were compared, each group reflected a favorable opinion toward management efforts (Table 14).

Northern landholders displayed their dissatisfaction with management practices more frequently than did southern landholders. The hypothesis \( H_0: \) Restriction of hunters was independent of landholder opinion about management of upland bird populations was rejected for both groups \( \chi^2_{0.995}(12) = 28.3 \) for northern landholders and \( \chi^2_{0.90}(6) = 10.6 \) for southern landholders. Restriction policies were influenced by landholders' opinions concerning management of upland birds. In both situations (enforcement of regulations and management of bird populations) landholders relied heavily on the "Undecided" category. This artifact probably caused the relationships to appear slightly stronger than they actually were. This could also be interpreted as evidence that additional information was desired by the landholders concerning these topics.

Upland bird hunting interest. Of those northern landholders restricting access by authorizing hunting on a "Hunt by Permission Only" basis, 64.3 percent were classed as "Regular" or "Ardent" upland bird hunters (Table 15). Among northern landholders, the group posting "No Hunting" or "No Trespassing" contained the highest percentage of non-hunters. Approximately 62.8 percent of the northern landholders participated to some extent in upland bird hunting.
Table 14. Restrictions on hunter access in relation to landholder attitudes toward management of upland game.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>%Excellent</th>
<th>%Good</th>
<th>%Undecided</th>
<th>%Poor</th>
<th>%Terrible</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northern Landholders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>2.2</td>
<td>20.7</td>
<td>46.7</td>
<td>13.0</td>
<td>17.4</td>
<td>92</td>
</tr>
<tr>
<td>Fee System</td>
<td>2.5</td>
<td>32.7</td>
<td>34.6</td>
<td>22.7</td>
<td>7.5</td>
<td>319</td>
</tr>
<tr>
<td>Permission Only</td>
<td>5.5</td>
<td>24.7</td>
<td>34.2</td>
<td>27.4</td>
<td>8.2</td>
<td>73</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>3.4</td>
<td>27.2</td>
<td>44.2</td>
<td>15.1</td>
<td>10.1</td>
<td>265</td>
</tr>
<tr>
<td>Totals</td>
<td>3.1</td>
<td>28.6</td>
<td>39.3</td>
<td>19.3</td>
<td>9.7</td>
<td>749</td>
</tr>
</tbody>
</table>

Chi-square = 31.2  df = 12

<table>
<thead>
<tr>
<th>Southern Landholders</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hunting or No Trespassing</td>
<td>5.6</td>
<td>11.1</td>
<td>55.6</td>
<td>22.2</td>
<td>5.6</td>
<td>18</td>
</tr>
<tr>
<td>Fee System</td>
<td>5.4</td>
<td>27.0</td>
<td>45.9</td>
<td>10.8</td>
<td>10.9</td>
<td>37</td>
</tr>
<tr>
<td>Permission Only</td>
<td>0.0</td>
<td>16.7</td>
<td>33.3</td>
<td>33.3</td>
<td>16.7</td>
<td>18</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>4.3</td>
<td>29.3</td>
<td>50.0</td>
<td>12.8</td>
<td>3.6</td>
<td>140</td>
</tr>
<tr>
<td>Totals</td>
<td>4.2</td>
<td>26.3</td>
<td>48.4</td>
<td>15.0</td>
<td>6.1</td>
<td>213</td>
</tr>
</tbody>
</table>

Chi-square = 11.42  df = 6
Table 15. Distribution of Utah landholders according to interest in upland bird hunting and methods used to restrict hunter access.

<table>
<thead>
<tr>
<th>Interest Level</th>
<th>Restriction Methods</th>
<th>%Ardent</th>
<th>%Regular</th>
<th>%Occasional</th>
<th>%Non-Hunter</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Northern Landholders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>12.8</td>
<td>22.1</td>
<td>14.0</td>
<td>51.2</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>Fee System</td>
<td>12.7</td>
<td>39.3</td>
<td>9.6</td>
<td>38.4</td>
<td>323</td>
<td></td>
</tr>
<tr>
<td>Permission Only</td>
<td>14.3</td>
<td>50.0</td>
<td>18.6</td>
<td>17.1</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>No Restrictions</td>
<td>11.2</td>
<td>34.6</td>
<td>17.7</td>
<td>36.5</td>
<td>260</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>12.3</td>
<td>36.7</td>
<td>13.8</td>
<td>37.2</td>
<td>739</td>
<td></td>
</tr>
<tr>
<td><strong>Chi-square = 5.45</strong></td>
<td><strong>df = 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Southern Landholders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>5.6</td>
<td>16.7</td>
<td>22.2</td>
<td>55.6</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Fee System</td>
<td>5.4</td>
<td>21.6</td>
<td>35.1</td>
<td>37.8</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Permission Only</td>
<td>6.3</td>
<td>25.0</td>
<td>25.0</td>
<td>43.7</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>No Restrictions</td>
<td>9.7</td>
<td>26.4</td>
<td>27.8</td>
<td>36.1</td>
<td>144</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>8.4</td>
<td>24.7</td>
<td>28.4</td>
<td>38.6</td>
<td>215</td>
<td></td>
</tr>
<tr>
<td><strong>Chi-square = 2.70</strong></td>
<td><strong>df = 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Among all landholders, southern landholders posting "No Hunting" or "No Trespassing" held the highest percentage of non-hunters (55.6 percent). Within the southern group, those not restricting access showed the highest percentages of "Ardent" and "Regular" hunters.

While general hunting participation rates between northern and southern landholders differed by only 1.3 percent, participation at high interest levels (ardent and regular) differed by 15.9 percent. Northern landholders were significantly (0.999, df=3) more interested in upland bird hunting than southern landholders. Roughly 5 of every 10 northern landholders were "Ardent" or "Regular" upland bird hunters. Among southern landholders this dropped to 3 of every 10 within the same interest categories. The hypothesis (H₀: Restriction of hunters was independent of hunting interest) failed rejection for northern and southern landholders (Χ²₀.90(3) = 6.25).

There was a definite trend among non-hunting northern landholders who restricted hunter access to do so by posting "No Hunting" or "No Trespassing." The hypothesis (H₀: Method of restriction of hunter was independent of hunting interest) was rejected (Χ²₀.995(6) = 18.5; calculated Χ² = 21.86).

No test was conducted on data from southern counties because of an insufficient sample size. However, there appeared to be a similar trend for non-hunters to restrict hunter access by posting "No Hunting" or "No Trespassing."

**Attitude toward hunting.** A complete treatment of landholder attitudes toward hunting follows in a later section. This discussion covers attitude toward hunting as it relates to methods of restricting hunter access. As shown in
Table 16, the "No Hunting or No Trespassing" category contained a higher percentage of landholders with unfavorable attitudes than any of the other restriction categories. This was true for northern (11.9 percent) as well as southern (16.7 percent) landholders. Tests of the hypothesis ($H_0$: Restriction of hunters was independent of landholder attitude toward hunting) failed rejection for both landholder groups ($X^2_{0.90(2)} = 4.61$). Restricting hunter access was independent of attitude toward hunting.

Governmental contact

**Federal cost-sharing programs.** A lower percentage of northern landholders participated in federal cost-sharing programs than did southern landholders (Table 17). This low participation of northern landholders, especially in the category "No Hunting" or "No Trespassing" was the factor responsible for rejecting the hypothesis ($H_0$: Restriction of hunters was independent of participation in federal cost-sharing programs) ($X^2_{0.90(3)} = 6.25$). For southern landholders the hypothesis failed rejection ($X^2_{0.90(3)} = 6.25$). More northern landholders restricted hunters by posting "No Hunting" or "No Trespassing," and less of these landholders participated in federal cost-sharing programs than would be expected statistically.

**Agricultural Act of 1970.** As enacted in 1970, the Agricultural Act included a provision establishing a system by which landholders could receive payment in exchange for permitting their lands to be used for recreation (hunting, fishing, camping, etc.). The intent was to expand recreational
Table 16. Comparison of hunter access restriction methods and landholder attitudes toward hunting as measured by a Likert Attitude Index.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%Favorable</td>
<td>%Undecided</td>
</tr>
<tr>
<td>No Hunt or No Trespass</td>
<td>75.0</td>
<td>13.1</td>
</tr>
<tr>
<td>Fee System</td>
<td>89.6</td>
<td>6.7</td>
</tr>
<tr>
<td>Permission Only</td>
<td>91.5</td>
<td>7.1</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>89.7</td>
<td>6.1</td>
</tr>
<tr>
<td>Totals</td>
<td>88.0</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Chi-square = 0.95, df = 2  
Chi-square = 3.95, df = 2
Table 17. Restriction of private property in relation to landholder participation in federal cost-sharing programs.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>Participation in Cost-Sharing Programs</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Yes</td>
<td>% No</td>
<td>n</td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td>19.8</td>
<td>80.2</td>
<td>86</td>
</tr>
<tr>
<td>Fee System</td>
<td>33.3</td>
<td>66.7</td>
<td>312</td>
</tr>
<tr>
<td>Permission Only</td>
<td>26.4</td>
<td>73.6</td>
<td>72</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>27.2</td>
<td>72.8</td>
<td>261</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>28.9</td>
<td>71.1</td>
<td>731</td>
</tr>
</tbody>
</table>

Chi-square = 7.1

Chi-square = 0.23

df = 3

df = 3
acreage. Since a high percentage of upland game resides on private property, this approach could have a profound effect on hunting.

Familiarity of both landholder groups with this legislation was comparable, but surprisingly low (Table 18). Only 6.9 percent of the northern landholders and 7.5 percent of the southern landholders had more than slight knowledge of this important act. That category of landholders restricting hunters through the "Hunt by Permission Only" method displayed the highest percentages of farmers and ranchers familiar with the provisions of the act (16.4 percent for northern counties and 20.0 percent for the southern counties).

The hypothesis \( H_0 : \) Restriction of hunters was independent of knowledge of the Agricultural Act of 1970) was rejected for the northern landholders \( (X^2_{0.975(6)} = 14.4) \). However, for southern landholders the hypothesis of independent restriction could not be rejected \( (X^2_{0.90(2)} = 4.61) \). Among northern landholders, the method of restricting hunters became more moderate as knowledge of the Agricultural Act of 1970 increased. Southern landholders restricted access independently of their knowledge of this act.

Incidental factors

Incidence of damage and abuse. Both northern and southern landholder groups assessed the incidences of hunter caused damage as increasing (27.7 percent for the north, 28.8 percent for the south). However, a larger percentage of northern landholders judged hunter-caused damage to be decreasing. In spite of this difference, the hypothesis \( H_0 : \) Restriction of hunters was independent
Table 18. Restriction of private property in relation to landholder knowledge of recreational land use benefits from the Agricultural Act of 1970.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>Knowledge of the Agricultural Act of 1970</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%Familiar</td>
<td>%Slightly</td>
<td>%No</td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td></td>
<td>7.2</td>
<td>23.7</td>
<td>69.0</td>
</tr>
<tr>
<td>Fee System</td>
<td></td>
<td>4.3</td>
<td>26.1</td>
<td>69.6</td>
</tr>
<tr>
<td>Permission Only</td>
<td></td>
<td>16.4</td>
<td>19.2</td>
<td>64.4</td>
</tr>
<tr>
<td>No Restriction</td>
<td></td>
<td>7.5</td>
<td>21.1</td>
<td>71.4</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>6.9</td>
<td>23.4</td>
<td>69.5</td>
</tr>
</tbody>
</table>

Chi-square = 15.5 df = 6
Chi-square = 2.91 df = 2
of assessment of damage) was rejected for northern landholders \((X^2_{0.975(6)} = 14.4)\), but the same hypothesis was not rejected for southern landholders \((X^2_{0.90(2)} = 4.61)\) (Table 19). Restriction policy of northern landholders was influenced by their assessment of the incidence of hunter damage.

The majority of northern and southern landholders agreed the incidence of abusive acts has remained approximately the same for the past 5 years. Those landholders posting "No Hunting" or "No Trespassing" had the highest percentage response to the increase in abuse category (Table 20). The hypothesis \((H_0: \text{Restriction of hunters was independent of the assessment of abuse})\) was rejected for northern landholders \((X^2_{0.99(6)} = 16.8)\), while the hypothesis failed to be rejected for southern landholders \((X^2_{0.90(2)} = 4.61)\).

Northern landholders, those in close proximity to industrialized, densely populated areas, assessed the incidence of damage and abuse as increasing and restricted hunter access accordingly. Although some southern landholders indicated hunter-caused damage and abuse was increasing, they did not increase access restriction significantly.

**Availability of land for next hunting season.** Because of clustering of data in the category "No Hunting or No Trespassing", the displays as well as independence tests were performed on a 2 x 2 basis—simply "Unrestricted" or "Restricted" (Table 21). Of northern landholders restricting hunter access in 1971, only 4.1 percent forecast opening their lands for 1972. In addition, of those who maintained their lands open to upland bird hunting in 1971, 59.1 percent forecast placing some type of restriction on hunter access for 1972. This meant upland
Table 19. Restriction of private property in relation to landholder evaluation of incidence of hunter-caused damage.

<table>
<thead>
<tr>
<th>Restriction Method</th>
<th>Northern Landholders</th>
<th></th>
<th>Southern Landholders</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%Decrease</td>
<td>%Increase</td>
<td>%Same</td>
<td>n</td>
</tr>
<tr>
<td>No Hunting or</td>
<td>15.8</td>
<td>42.1</td>
<td>42.1</td>
<td>76</td>
</tr>
<tr>
<td>No Trespassing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fee System</td>
<td>14.8</td>
<td>23.0</td>
<td>62.3</td>
<td>244</td>
</tr>
<tr>
<td>Permission Only</td>
<td>16.2</td>
<td>26.5</td>
<td>57.4</td>
<td>68</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>9.8</td>
<td>28.3</td>
<td>62.0</td>
<td>205</td>
</tr>
<tr>
<td>Totals</td>
<td>13.3</td>
<td>27.7</td>
<td>59.0</td>
<td>593</td>
</tr>
</tbody>
</table>

Chi-square = 15.3 df = 6

Chi-Square = 0.53 df = 2
Table 20. Restriction of private property relative to landholder assessment of the incidence of abuse received from hunters.

<table>
<thead>
<tr>
<th>Restriction Methods</th>
<th>Northern Landholder</th>
<th></th>
<th></th>
<th>Southern Landholder</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%Decrease</td>
<td>%Increase</td>
<td>%Same</td>
<td>n</td>
<td>%Decrease</td>
<td>%Increase</td>
<td>%Same</td>
</tr>
<tr>
<td>No Hunting or No Trespassing</td>
<td></td>
<td></td>
<td></td>
<td>9.5 48.6 41.9 74</td>
<td>20.0   46.7 33.3 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fee System</td>
<td>9.8</td>
<td>24.0</td>
<td>66.1</td>
<td>254</td>
<td>9.1     18.2 72.7 22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permission Only</td>
<td>11.4</td>
<td>30.0</td>
<td>58.6</td>
<td>70</td>
<td>0.0     33.3 66.7 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Restriction</td>
<td>7.1</td>
<td>28.4</td>
<td>64.5</td>
<td>211</td>
<td>7.4     29.6 63.0 81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>9.0</td>
<td>29.2</td>
<td>61.7</td>
<td>609</td>
<td>8.3     28.1 63.6 133</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chi-square = 19.2 df = 6

Chi-square = 0.48 df = 2
Table 21. Hunter access restrictions as related to landholder forecasts of availability of land for the following hunting season.

<table>
<thead>
<tr>
<th>1971 Restriction Policy</th>
<th>Northern Landholder</th>
<th>Southern Landholder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%Unrestricted</td>
<td>%Restricted</td>
</tr>
<tr>
<td>Restrictions</td>
<td>4.1</td>
<td>95.9</td>
</tr>
<tr>
<td>No Restrictions</td>
<td>40.9</td>
<td>59.1</td>
</tr>
<tr>
<td>Totals</td>
<td>20.2</td>
<td>79.8</td>
</tr>
</tbody>
</table>

Chi-square = 153.6  df = 1
Chi-square = 37.86  df = 1
bird hunters in northern Utah counties could have expected some type of restriction from 8 of every 10 landholders in 1972. For northern landholders the hypothesis \( H_0 \): forecasts for future access to land was independent of present hunter restrictions) was rejected \( \chi^2_{0.999(1)} = 10.8 \).

The hypothesis of independence was rejected for southern landholders \( \chi^2_{0.999(1)} = 10.8 \), but there was no strong trend of landholders to switch to restrictive policies. Of those who maintained their lands open in 1971, only 29.6 percent forecast instituting some type of restrictive activity against hunters in 1972. The percentages of landholders switching restriction policies (within the forecast category) indicated there should only have been a rise of 4.6 percent in the numbers of southern landholders who restricted upland bird hunters in 1972.

**Conditions requested by landholders for permitting hunting**

**Conditions requested of individual hunters**

Landholders were presented 11 conditions and asked to choose which of them must be met by hunters before permission would be granted to hunt on restricted lands. The distribution of landholder responses is displayed in Table 22. Response patterns from both northern and southern landholders was consistent in selecting against those conditions involving fees or payment for hunting privileges. Although direct or indirect payment for hunting would not be required by landholders, compensation for hunter-caused damage would be required by 12.9 percent of the northern landholders and 11.4 percent of the southern landholders.
Table 22. Conditions under which individual hunters could gain access to posted lands.

<table>
<thead>
<tr>
<th>Conditions Requested of Individual Hunters</th>
<th>N. Utah (%)</th>
<th>S. Utah (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If he asks my permission</td>
<td>30.0</td>
<td>33.1</td>
</tr>
<tr>
<td>If I know him personally</td>
<td>13.6</td>
<td>17.9</td>
</tr>
<tr>
<td>If he pays me a fee</td>
<td>2.5</td>
<td>1.6</td>
</tr>
<tr>
<td>If he belongs to an organization that will repair or compensate me for damages he causes</td>
<td>12.9</td>
<td>11.4</td>
</tr>
<tr>
<td>If he had to pass firearms safety tests before he could buy a license</td>
<td>12.6</td>
<td>11.4</td>
</tr>
<tr>
<td>If he provided me with some resources (money, feed, labor, etc.) for raising game</td>
<td>3.0</td>
<td>3.5</td>
</tr>
<tr>
<td>If he were required to carry liability insurance to cover damages and injuries</td>
<td>9.4</td>
<td>6.7</td>
</tr>
<tr>
<td>If he would show some friendship after the hunting season</td>
<td>12.0</td>
<td>9.7</td>
</tr>
<tr>
<td>If he helps me with the farm or ranch work</td>
<td>1.2</td>
<td>1.6</td>
</tr>
<tr>
<td>If he would share his bag with me</td>
<td>0.8</td>
<td>0.6</td>
</tr>
<tr>
<td>Under no conditions would I permit an upland bird hunter to hunt on my land</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Conditions requested of hunting organizations

Response patterns of landholders to conditions requested of organizations are listed in Table 23. Landholders, both northern and southern, still selected against those items requiring fees or payment from the hunter, either in terms of money or work. Again, the exceptions to this were the high percentages of respondents who selected compensation from hunters for damages (21.7 percent of the northern and 20.8 percent of the southern landholders).

Landholder Attitudes Toward Hunting

Data in this section were analyzed for correlation using Kendall tau statistic. The Pearson Product Moment Correlation is frequently used by survey researchers when correlating attitude scale results with question responses. The basic assumption for Pearson r is that the change in the relationship between variables is direct and proportional, i.e. a change in one variable evokes a change in the other in the same direction and with the same intensity. Since this assumption could not be met and since Kendall tau is specifically designed to deal with situations where large numbers of observations are forced into a few observation categories, Kendall tau was the best statistic (Gulliford, 1965).

Post season 1971 attitudes

Attitude assessment was performed on the basis of a Likert five-point Index with 55 points representing the most favorable attitude and 11 points the least favorable.
<table>
<thead>
<tr>
<th>Respondents</th>
<th>Conditions requested of Hunting Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. Utah</td>
<td>S. Utah</td>
</tr>
<tr>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>5.9</td>
<td>7.3</td>
</tr>
<tr>
<td>3.7</td>
<td>3.5</td>
</tr>
<tr>
<td>21.7</td>
<td>20.8</td>
</tr>
<tr>
<td>6.6</td>
<td>10.6</td>
</tr>
<tr>
<td>18.1</td>
<td>20.4</td>
</tr>
<tr>
<td>4.3</td>
<td>4.9</td>
</tr>
<tr>
<td>9.5</td>
<td>7.3</td>
</tr>
<tr>
<td>14.5</td>
<td>9.8</td>
</tr>
<tr>
<td>8.8</td>
<td>9.4</td>
</tr>
<tr>
<td>2.8</td>
<td>2.5</td>
</tr>
<tr>
<td>4.3</td>
<td>3.3</td>
</tr>
</tbody>
</table>

100.0 100.0
Northern landholders categorized according to the industrialization of their areas scored 39.9 of 55.0 points in industrial areas, and 40.9 of 55.0 points in agricultural regions. The mean score for northern landholders was 40.4. Southern landholders scored slightly higher with a mean of 41.0. T-tests between landholder categories (H: $\mu_1 = \mu_2$ and $\alpha = 0.05$) showed no significant difference existed. The mean Likert score calculated for all 11 counties sampled was 40.7, indicating an attitude generally favorable toward hunting.

Eighty-eight percent of the northern landholders favored the concept of hunting, and 91.0 percent of the southern landholders also favored hunting (Table 16). The difference in these percentages reflected the slightly more favorable attitude of the southern landholders. The "Undecided" category for northern landholders contained consistently higher percentages than did this category for southern landholders. This reflected the heavy "Undecided" response from northern industrial landholders.

Pre-season 1972 attitudes

Data collected through a second questionnaire (mailed August, 1972 immediately preceding the upland bird season) revealed that the respondents' attitude toward hunting (as measured by the mean Likert score for all 11 counties) had not statistically changed from winter, 1971 (H: $\mu_1 = \mu_2$ and $\alpha = 0.05$). The 1972 mean score was 42.7 and was based on responses to the same statements (in a different sequence) used the previous winter. Within the group
of landholders sampled, no change in attitude toward hunting was detected from post-season 1971 to pre-season 1972.

**Attitude toward resource agency**

Hunting regulations enforcement

Choices available to landholders to display their attitudes ranged from "Excellent" to "Terrible." Of northern landholders, 31.0 percent felt the agency was doing a "Good" to "Excellent" job while 36.7 percent considered the agency's efforts "Poor" to "Terrible" in enforcement (Table 13). The remaining 32.4 percent were "Undecided." A Goodness-of-fit Chi-square test ($H_0$: Observed percentages did not differ from 33.3 percent distribution) yielded a $X^2 = 5.25$. On this basis, the hypothesis was rejected ($X^2_{0.90(2)} = 4.61$). Northern landholders displayed a slight dissatisfaction with the agency's efforts of law enforcement during the upland bird season.

Southern landholders, however, were distributed with 37.5 percent choosing "Good" to "Excellent" and 20.5 percent choosing "Poor" to "Terrible." A larger portion of southern than northern landholders selected the "Undecided" category (42.0 percent). Testing the hypothesis of equal distribution yielded a $X^2 = 16.76$. Again, the hypothesis was rejected for $X^2_{0.999(2)} = 13.8$. While southern landholders displayed no definite dissatisfaction, there still was no strong degree of satisfaction shown. These landholders appeared to moderately favor the agency's efforts, but most remained "Undecided."
Management of upland bird populations

Among northern landholders, 31.7 percent rated the agency’s bird management efforts "Good" to "Excellent;" 29.0 percent rated the efforts "Poor" to "Terrible." "Undecided" landholders comprised 39.3 percent of northern landholders (Table 14). These percentages did differ from an equal distribution ($X^2_{0.995(2)} = 10.6$; calculated $X^2 = 13.2$). There was a slight trend toward favoring the management efforts, yet the highest percentage of landholders remained "Undecided."

For the southern landholders, 30.5 percent felt the agency’s efforts were "Good" to "Excellent" with 21.1 percent placing efforts at "Poor" to "Terrible." A high percentage (48.4) were "Undecided." This distribution differed from an expected equal distribution when $X^2_{0.999(2)} = 13.8$ (calculated $X^2 = 68.4$). There was some indication that southern landholders favored the agency’s efforts; however, as with the northern group, there was heavy reliance on "Undecided."

Attitude toward restricted license sales and sight and hearing tests for hunters

Reactions of landholders to statements concerning restrictions on the number of small game licenses sold and requiring periodic sight and hearing tests of hunters are displayed in Table 24. Responses between landholder groups to each of the statements were not statistically different when $X^2_{0.90(2)} = 4.62$ (calculated $X^2 = 4.00$ for restricted license sales, and $X^2 = 1.68$ for requiring
Table 24. Attitudes of landholders toward restricting the sale of small game licenses and requiring sight and hearing tests for hunters.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Northern Landholders</th>
<th>Southern Landholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%Yes</td>
<td>%Undecided</td>
</tr>
<tr>
<td>Restrict license sales</td>
<td>31.7</td>
<td>17.3</td>
</tr>
<tr>
<td>Require sight and</td>
<td>63.4</td>
<td>13.4</td>
</tr>
<tr>
<td>hearing tests</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
sight and hearing tests). However, when comparisons were made within each landholder group, results were statistically different \( \chi^2_{0.999(2)} = 13.8; \) calculated \( \chi^2 = 159.42 \) for northern landholders, and \( \chi^2 = 25.04 \) for southern landholders).

There was a distinct preference from both northern and southern landholder groups for requiring hunters to pass periodic sight and hearing tests. There also existed for both landholder groups a preference for not restricting the number of small game licenses sold. Given the choice between restricting licenses sales or requiring sight and hearing tests, both landholder groups strongly favored the latter.

**General attitude correlations**

Of 20 correlation categories tested for influence on landowner attitudes, only 3 showed consistent sign and significance between landholder groups (Table 25). These categories were: a) "Upland Bird Hunter Classification" \( (p \leq 0.0001) \), b) "Attitude Toward Hunting Regulations Enforcement" \( (p \leq 0.001) \), c) "Attitude Toward Upland Bird Population Management" \( (p \leq 0.005) \).

Data for northern landholders showed a strong negative correlation \( (p \leq 0.005) \) between attitude toward hunting and assessment of the incidence of abuse, yet the relationship between attitude toward hunting and assessment of the incidence of damage was considerably less \( (p \leq 0.013) \). Neither the incidence of damage nor the incidence of abuse showed strong relationships with attitude toward hunting for southern landholders \( (p \leq 0.13, p \leq 0.18 \) respectively). Regardless of the
Table 25. Landholder attitude toward hunting (based on a Likert Index) correlated with various landholder characteristics.

<table>
<thead>
<tr>
<th>Landholder Characteristics</th>
<th>Northern Landholder</th>
<th>Southern Landholder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sign</td>
<td>Sig.</td>
</tr>
<tr>
<td>Upland Bird Hunter Classification</td>
<td>P</td>
<td>.0001</td>
</tr>
<tr>
<td>Attitude Toward Hunting Regulation Enforcement</td>
<td>P</td>
<td>.001</td>
</tr>
<tr>
<td>Attitude Toward Upland Bird Population Mgmt.</td>
<td>P</td>
<td>.005</td>
</tr>
<tr>
<td>Forecast of Land Availability for 1972</td>
<td>P</td>
<td>.031</td>
</tr>
<tr>
<td>Forecast of Land Availability for 1973</td>
<td>N</td>
<td>.010</td>
</tr>
<tr>
<td>Appraisal of Incidence of Damage</td>
<td>N</td>
<td>.005</td>
</tr>
<tr>
<td>Appraisal of Incidence of Abuse</td>
<td>P</td>
<td>.045</td>
</tr>
<tr>
<td>Years of Farm or Ranch Experience</td>
<td>P</td>
<td>.002</td>
</tr>
<tr>
<td>Membership in Organizations</td>
<td>P</td>
<td>.002</td>
</tr>
<tr>
<td>Officer in Organizations</td>
<td>P</td>
<td>.050</td>
</tr>
<tr>
<td>Education Completed</td>
<td>N</td>
<td>.050</td>
</tr>
<tr>
<td>Total Amount of Agri. Land Controlled</td>
<td>N</td>
<td>.044</td>
</tr>
<tr>
<td>Acres of Hay</td>
<td>N</td>
<td>.033</td>
</tr>
<tr>
<td>Acres of Pasture</td>
<td>N</td>
<td>.013</td>
</tr>
<tr>
<td>Acres of Cannery Crops</td>
<td>N</td>
<td>.026</td>
</tr>
<tr>
<td>Acres of Cereal and/or Feed Grain</td>
<td>N</td>
<td>.005</td>
</tr>
<tr>
<td>Acres of Silage</td>
<td>N</td>
<td>.013</td>
</tr>
<tr>
<td>Acres of Produce</td>
<td>P</td>
<td>.013</td>
</tr>
<tr>
<td>Acres of Sugar Beets</td>
<td>N</td>
<td>.013</td>
</tr>
</tbody>
</table>

The symbol P stands for positive.
The symbol N stands for negative.
Sig. - Level of significance.
significance of these correlations, the direction in all cases was negative indicating that as assessments of damage and abuse rose, intensity of a favorable attitude toward hunting decreased.

The variables involving landholders participating as members and/or officers of agricultural and/or sportsman organizations were highly correlated with attitudes toward hunting in the northern landholder group \((p \leq 0.002)\). Neither of these variables was highly correlated with attitudes toward hunting for the southern landholder group.

A highly significant, positive correlation was found between "education Completed" and "Attitude Toward Hunting" for southern landholders \((p \leq 0.008)\). This relationship, while positive in direction, was not as significant for northern landholders \((p \leq 0.050)\). Of the 8 land use categories tested, the only variables showing high correlations with attitude toward hunting were "Acres of Silage" \((p \leq 0.005)\) for northern landholders and for southern landholders "Acres of Produce" \((p \leq 0.005)\).

Should it be necessary to predict the attitudes of Utah landholders toward hunting, data for 1) hunting interest, 2) attitude toward hunting regulation enforcement and management of game populations, 3) landholder appraisal of incidence of damage, 4) acres of hay and grains appear to be most valuable on a state wide basis. Before beginning such a task, it would be well to establish whether "the end justifies the means." As explained in the discussion section, knowledge of attitudes alone may be of limited value to a management agency (Heberlein, 1973).
DISCUSSION

Restricting Hunter Access to Private Land

Agricultural Act of 1970
and communication between
landholders and resource managers

During the course of this study there was federal legislation in effect that illustrates the type of progressive action necessary to combat the potentially crippling problem of hunter access restriction. As enacted by the 91st Congress, the Agricultural Act of 1970 provided for payments to landholders for permitting public access to private lands for recreation under provisions of Title IV, section 402; Title V, section 501; Title VI, section 602; Title VIII, section 801. In addition, under the Soil Conservation and Domestic Allotment Act, Land Use Adjustment Program section 16 (e) (1) (A) it was specifically stated that:

For the purpose of promoting the conservation and economic use of land . . ., the Secretary, . . . is authorized to enter into agreements, during the calendar years 1971, 1972, and 1973, . . . with farm and ranch owners and operators . . . for the purpose of conserving and developing soil, water, forest, wildlife and recreation resources.

Section 16 (e) (1) (B) of the Soil Conservation and Domestic Allotment Act stated further:

Such acreage may be devoted to approved wildlife food plots or fish and wildlife habitat . . . in conformity with standards developed by the Secretary in consultation with the Secretary of Interior. . . . The Secretary may also provide for payment in an amount determined by the Secretary to be appropriate in
relation to the benefit to the general public if the producer agrees to permit access, without other compensation, to all or such portion of the farm as the Secretary may prescribe by the general public, for hunting, trapping, fishing, and hiking, subject to applicable State and Federal regulations. (Committee on Agriculture, 1970)

Twenty percent fewer landholders who claimed familiarity with the Agricultural Act of 1970 restricted hunter access by posting "No Hunting" or "No Trespassing" than landholders who were unfamiliar with the act. The tendency was for landholders to select more moderate restrictions as their familiarity with the act increased. These land retirement and land use adjustment programs should have been attractive to landholders, especially livestock raisers who were considering retirement but wanted to remain on their lands. Provisions in the act permitted guaranteed payment, and still permitted use of the lands for growing "... tame hay, alfalfa, and clovers..."

Overshadowing the above mentioned relationship is the fact that approximately 70 percent of the landholders sampled had no knowledge of the recreational land payments provision of the act even though such provisions had been in previous acts since at least 1966. Only 23 percent of the landholders had even slight knowledge, and a low 7 percent claimed to be familiar with these provisions.

When landholders were asked to indicate how often in the past 5 years State resource managers had solicited suggestions on how to keep private lands open to public access the response was that 93.3 percent answered "Never." Only 6.7 percent had been so contacted (Table 1).
How should these data be interpreted? (1) Does the 6.7 percent represent the fraction of landholders contacted who are chronically restrictive with access? (2) Does it represent the fraction of the population actively solicited for constructive information? This is a difficult point to assess and this study was not designed to address it directly. However, there is sufficient evidence to warrant consideration. Since the evidence is largely inferential, too strict interpretation could lead to erroneous conclusions. No attempt has been made to establish a cause-effect relationship.

Closer examination of the aforementioned percentage (6.7 percent) indicates that 1.5 percent represents the portion of landholders contacted about land access more frequently than once a year, e.g. 15 of every 1000 landholders or approximately 225 throughout the state per year. Within the 11 county area, 12 percent of the landholders restricted hunter access by using "No Hunting" or "No Trespassing" restrictions. If these represent the portion of the population that are chronically restrictive, then only 12.5 percent received more than one visit per year from the resource managers. When those landholders contacted about hunter access as infrequently as "A few times in 5 years" (broadly interpreted as once a year) are considered, the number of contacts increase by over 3 times. Yet, 58 percent of those who post "No Hunting" or "No Trespassing" are still not among the landholders contacted. This is not consistent with established techniques for solving such a problem. Question (1) is dismissed as inappropriate. The percentage does not appear to represent the chronically restrictive individuals.
Ninety-three percent of the respondents indicated they were poorly informed or uninformed about the recreational land payment provision of the Agricultural Act of 1970. Furthermore, 93 percent of the respondents also indicated they were "Never" contacted by resource managers regarding hunter access during the 5 years previous to the study. Finally, 44 percent of the respondents rated themselves "Undecided" as to how well the Division of Wildlife Resources was managing upland birds and 37.2 percent were "Undecided" about how well the hunting regulations were being enforced. People select the "Undecided" response for one of two reasons (a) to avoid reprisals by hiding their true feelings, (b) because they feel they do not have sufficient information to make a value judgment. Choice (a) seems inappropriate since all responses were confidential and maximum anonymity was maintained by using a mail questionnaire. Choice (b) is appropriate. Smith (1975) found all surveys subject to reporting errors and where over-reporting or under-reporting occurred, it was an attempt by the respondent to make his report compatible with social norms. Regardless of the inherent accuracy of the above data, the relative separation of response categories still supports the position that there was a weak link between resource managers and landholders. That link was communication.

At the 51st annual conference of Western State Game and Fish Commissioners, Poole (1971, p. 21) commented:

To enjoy wildlife, there must be access to public and private lands. And to attempt to take wildlife, there must be public acceptance. . . . This latter facet--public acceptance--has much to do with the future of hunting. . . . And it is in this important area that our wildlife agencies do the least.
Granted, the topic was "Hunting" and not "Access," but the two must be considered together. To be effective, a resource agency must develop and maintain an elaborate and aggressive communication system. The focus of this communication should be that segment of society supporting the production of our wildlife—the landholders. This is one of the areas Lindzey and Wingard (1970) referred to when they named the "... state game agency ..." as the agent to lead the way in developing future resource management programs.

**Variables influencing hunter access restrictions**

Landholder restriction practices against hunters were compared with 16 demographic and attitude characteristics and landholder's statements of intended restriction practices for the following hunting season. Only six of these variables were not significant at the 90 percent level. These six non-significant variables were: 1) years of farm/ranch experience, 2) alternate employment status, 3) education completed, 4) type of agricultural crop produced, 5) membership in agricultural/sportsman organizations, 6) attitude toward hunting.

These findings are in agreement with findings of Waldbauer (1966) in New York with respect to the landholder's degree of education and land restrictions. Barclay (1965), however, concluded that for Pennsylvania landholders, better educated individuals tended to impose greater restrictions on access to their lands. The findings here do not preclude Barclay's, rather they suggest other factors may be of more immediate importance to Utah landholders.
It was surprising to note there was no significant relationship between crop type and hunter restriction. The most probable reason for this is the Utah pheasant season is the main upland bird hunting period with respect to landholder/hunter conflict. Typically, this season opens in mid-November by which time virtually all crops are harvested. Exceptions for some areas would be winter wheat, sugar beets, permanent fruit orchards, and some silage corn. Winter grain plantings are relatively unattractive to hunters and, therefore, are mostly undisturbed. Sugar beets are not easily damaged by hunters or their dogs because of growth characteristics, even though these areas are attractive to hunters. Fruit orchards do pose a problem where they occur, and many landholder comments were received concerning this. Corn silage stands are usually attractive to hunters and are susceptible to damage from dogs as well as hunters. By mid-November, however, there are few silage crops unharvested. Even though on an individual basis these areas are a vital concern, they represent only a small portion of problem areas.

A study completed in New Hampshire (Environment Services, 1971) found "... a high correlation between amount of disturbance/damage ... and the posting of land." I found strong positive correlations between land restriction and assessment of the incidences of abuse and hunter-caused damages. This is consistent with modern social psychological theory (Deutsch and Krauss, 1965). Landholders who assess damage and abusive acts as increasing have conflicting conditions with which to cope. Any action other than protection of property would cause a state of dissonance within the landholder. It follows that landholders
could be expected to use restrictive measures compatible with their assessment of the potential for damage and abuse.

Consistent with the pattern of property protection is a strong negative relationship between restriction practices and landholder attitudes toward enforcement of hunting regulations during the upland bird season. Obviously, one feature accompanying a favorable attitude toward law enforcement is a greater sense of security for person and property. An individual feeling insecure would need to be protective; hence, an increase in moderate to stringent posting practices would be expected.

Festinger (1950) suggested that in certain situations people are dependent on social reality to establish confidence in a belief. Once confidence is established, reinforcement is accomplished through reactions of group members. In areas where all their neighbors restricted access, landholders relied heavily on the "Hunt by Permission Only" form of restriction. By requiring permission, they were able to comply with group pressure to restrict access while still adhering to the American tradition of free and relatively unrestricted access to land for hunting as mentioned by McIntosh (1967). This particular method also served to at least partially accomplish several other desirable tasks as discussed by Waldbauer (1966). It serves to reduce the numbers of hunters using the land; it permits the landholder to identify some of the hunters and specify to the hunters areas to be avoided during the hunt; it may tend to be less offensive to easily provoked hunters thus avoiding possible property damage from acts of retaliation.
Assignment of landholders to hunting interest categories was on the basis of self-stated interest. If the landholder indicated enjoyment of upland bird hunting enough to absorb some inconvenience in order to hunt, he was considered an "Ardent" hunter. A "Regular" hunter was one who really enjoyed upland bird hunting but not more than any other type of hunting. "Occasional" hunters were those who enjoyed upland bird hunting, but other types of hunting were more enjoyable. And "Non-hunter" is self explanatory; this category did include those landholders who did not enjoy upland bird hunting even though they may have enjoyed other types of hunting. The relationship between stringent posting practices and upland bird hunting interest of landholders is highly significant (99.5 percent) and negative, i.e. as hunting interest increases, the tendency toward stringent restriction decreases.

The relationship between restriction policy and participation as an officer in agricultural/sportsman organizations showed that officers from both organizations tended toward less stringent restrictions while actually holding office. An additional test was conducted and it was found that landholders who had been club officers in the past 5 years also tended to use more moderate restriction methods than landholders who had not been club officers.

For parcels of land 20-60 acres, landholders were most likely to restrict access through use of "No Hunting" or "No Trespassing" signs. As acreage controlled increased, restriction practices of landholders became more moderate. At first glance this seems inconsistent with the concept of the "Economic Man" (Dale, 1965, p. 559) i.e. "... he maximizes... profits as far as his ability,
the law, and his ethical standards permit." Hence, what might ordinarily be expected is a trend toward more severe restriction practices as acreage controlled increases. There are two possible explanations for the observed trend. First, it is plausible to expect landholders to assess, even if intuitively, relationship between possible benefits from restricting access and costs involved. As area expands, effort required to maintain any type of restriction system will rise. The more restrictive the system, the more effort will be required to maintain it at any given level of efficiency. Data from Table 8 suggest landholders assess costs of restricting access by "No Hunting" or "No Trespassing" regulations to be prohibitive on properties in excess of 200 acres.

The second possible explanation concerns the idea that landholders assess the relative possibilities for incurring some loss (damage or abuse) according to size of their land holdings. For two areas comparable in quality but differing in size, the possibilities for suffering losses on the smaller area are greater as an artifact of concentration of activities. This, of course, assumes no controls over access to either area. It appears then, that severe restriction will be of benefit to owners of smaller acreage since it should cost less to maintain severe restrictions and, at least on a percentage basis, these lands carry greater possibility for incurring loss from damage.

In both explanations, landholders would have acted in other than a strictly economic fashion—they would have "satisficed." Satisficing is selection of an alternative considered to be satisfactory though not economically the best
(Simon, 1957). This is a popular way of explaining administrative decision making that permits interjection of human response to such variables as tradition, ego aggrandizement, and other nonmonetary remunerations.

To state that Utah landholders are "Economic Men" in the strict sense, implies they are unaware of the monetary potential of wildlife resident on their lands. This is too naive, especially considering the impact on economics of hunter access of such land leasing agencies as The American Sportsmans' Club. Land management practices of large ranches in Texas and California in regard to hunt club leases and easements are well publicized. Furthermore, when confronted with the idea of selling hunting privileges to make a profit, respondent landholders strongly rejected the proposal.

A plausible consideration might be that Utah landholders, while aware of the monetary potential for controlled distribution of wildlife harvest on private property, have chosen not to enter this business. Tradition is difficult to change. Teague (1970, p. 142) believes that one of the important reasons for slow acceptance of wildlife enterprises is that people view these as "... commercialization of the publics' fish and game." This may not be the sole explanation, Arnett (1972, p. 55) observed:

The principles of economics apply. We can't expect the landowner to produce a crop of fish and wildlife unless he knows there is a market. And the urban hunter . . .--the landowner's market--has to know where he can find good hunting . . . opportunities.

It appears Utah landholders are satisfied with present trends in monetary returns from existing land management practices. Are they really? Undoubtedly some
acquire "psychic income" from maintaining the tradition of permitting free, unrestricted or relatively unrestricted access to huntable lands. Others might not be able to identify a "market" for wildlife products.

Data are insufficient to permit a prediction as to how persistent this condition might be. It is too much to expect that it will last indefinitely. Restricting hunter access to private land for whatever reason is becoming more prevalent. Arnett (1972, p. 56) states: "If the trend continues without some sort of intervention, the unattached sportsman stands a good chance of being left outside looking in." Trends in other states indicate landholder acreage is increasing and as it does, restriction to hunter access becomes more severe. Land ownership changes from family proprietorships to corporate holdings. Attendant with this are changes in management philosophy based on reference group standards permitting landholders to assume a more truly economic approach and view hunter access as provision of a service. In this situation, compensation becomes the key to hunter access. In preparation for this, all resource management agencies and recreational land users should be prepared to offer landholders alternate resource management plans.

In Utah the number of farms peaked in 1936 when there were 30,800. Thereafter, farm numbers continually declined. By 1972 there were only 13,500 farms in the state. Coincident with the decline in numbers was an increase in the average acreage per farm from 354 acres in 1940 to 963 acres in 1972 (Nish, 1973). There seems little doubt that Utah is headed along the same route as more urbanized states with regard to availability of private land for public hunting.
Who should lead in developing future management plans?

I submit that it is the duty and responsibility of the Game, Fish and Parks Commission . . . to do everything within its power to commit its efforts toward development of a wildlife program in which the private land ownership is a recognized participation feature. (Combs, 1971, p. 18)

Indeed, the Commissioner of the Colorado Division of Game, Fish and Parks is not the only manager who feels this way. Lindzey and Wingard (1970) believe, "The state game agency should lead in the development of access programs . . . ." Furthermore, these authors charge the United States Department of Agriculture and the United States Department of the Interior with leadership responsibility.

Kimball (1962) indicated that as much as 85 percent of improvable wildlife habitat in the United States is privately owned. Because of this and because roughly 80 percent of upland game harvested in the United States is taken on private land, success of future wildlife management programs depends upon receiving the cooperation of private landholders. Over 75 percent of the Utah landholders surveyed indicated they felt small animals were desirable products of their lands. Landholders would be willing partners in well planned management programs, but they need to be accepted as partners (Teague, 1970). Many states have acted slowly in this regard.

California, a state frequently among the leaders in conservation movements, has only recently (1966) accepted this idea of partnership with the landholder. Review procedures for funding management projects were previously based upon the technical and biological soundness of the program. Now, wildlife
managers must also demonstrate that their programs have the support of private landholders. Failure of a program to pass any of these reviews means rejection.*

This action, though seemingly bold and progressive, does not satisfy the economic demands placed on landholders for raising wildlife. Arnett (1972) feels monetary incentives are important, as is a feeling of participation as a partner. In this regard, the California Department of Fish and Game is preparing a proposal for legislation that would permit the Department to sell to a landholder, harvest rights for set numbers of game animals on his property. The landholder would then be free to distribute these harvest rights according to whatever system yielded the desired economic return so long as the harvest remained a recreational activity. Under this system, the resource management agency would be responsible for (1) determining the basic management program, (2) establishing the limits of harvest, and (3) enforcement of harvest regulations. The landholder would have the responsibility for (1) following the management plan but would be free to perform additional (state approved) habitat improvements, and (2) adhering to harvest limits and regulations. Here is an example of offering the landholder the opportunity to participate as a full partner in the management of our wildlife resource.

Lest one conclude the only way to assure hunter access is through monetary incentives to landholders, refer to the "Feel Free to Hunt" program in the state

*Personal communication on December 4, 1974, with E. G. Hunt, Chief Wildlife Management for California Department of Fish and Game.
of Washington. This program began in 1964 as an experiment. Since then an average of 90,000 acres has been managed annually under this program. Comments from both hunters and landholders are favorable, and the program has a 70 percent continuance rate for landholders (Crouse, 1972).

The aggressive program Nish (1973) has proposed for pheasant habitat rehabilitation in Utah may also serve the purpose of reducing hunter access problems. Proposed incentives to landholders include (1) direct payment of a use fee; (2) increased responsibility of resource agency for fee collection, posting of exclusion area, and enforcement of trespass laws; (3) assisting landholders in planning wildlife habitat improvements; (4) donation of planting stock and seed; (5) cost-sharing on major developments; (6) public recognition. These incentives appear to be suitable factors for allowing landholders to feel a real sense of participation in a management program.

Gaining access to restricted lands

Under what conditions would landholders permit hunters access to restricted lands? Utah hunters should be able to significantly increase the acreage available for upland bird hunting by meeting one or a combination of the following conditions specified by respondent landholders:

(A) Request permission to hunt from the landholder.

(B) Furnish proof of membership in an organization that would repair or pay for damages caused by member hunters.

(C) Furnish proof of having passed a state administered firearm safety exam prior to licensing.
(D) Show friendship to the landholder after the hunting season.

(E) Furnish proof of owning liability insurance that would compensate the landholder for damages.

(F) All of the above.

Calculations of land availability were based on responses of individual landholders to questions concerning (1) size of land holdings, (2) proportions of lands under various restriction categories, (3) land use patterns, (4) conditions required of hunters before access would be granted. Land used as feedlots, winter wheat plantings, horticultural nurseries and orchards were considered unsuitable for hunting and represented approximately 40 percent of restricted lands. Percentages in the land availability categories and approximate acreages (Figures 2 and 3) were adjusted in accordance with remaining land that was suitable for hunting (60 percent).

Responsibility of hunters

Condition (A) shows the most dramatic effect of any of the conditions on opening land for hunting. The largest contribution is definitional, e.g. those lands restricted by posting "Hunt by Permission Only" now become available. This amounts to approximately 18 percent for northern Utah counties and 4 percent for southern counties. However, an additional 5.9 percent or approximately 6065 acres of land in northern counties and 1.5 percent or approximately 455 acres in southern counties could be available from lands posted "No Hunting" or "No Trespassing" if hunters would request permission to hunt.
Not Available
Permission Only
Pheasant Unit
Open
Estimated additional acreage that would be open under each procedure

<table>
<thead>
<tr>
<th>Percent of Land Available</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
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</thead>
<tbody>
<tr>
<td>Land Status changes under different hunter access procedures</td>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
<td>(F)</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>(A)</td>
<td>32.2</td>
<td>56.2</td>
<td>6065</td>
<td>34.7</td>
<td>34.6</td>
<td>34.5</td>
<td>34.0</td>
<td>30.1</td>
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<td>30.1</td>
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<tr>
<td>(B)</td>
<td>30.1</td>
<td>30.1</td>
<td>2570</td>
<td>30.1</td>
<td>30.1</td>
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<tr>
<td>(C)</td>
<td>30.1</td>
<td>30.1</td>
<td>2467</td>
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</tr>
<tr>
<td>(D)</td>
<td>30.1</td>
<td>30.1</td>
<td>2364</td>
<td>30.1</td>
<td>30.1</td>
<td>30.1</td>
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<td>30.1</td>
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</tr>
<tr>
<td>(E)</td>
<td>30.1</td>
<td>30.1</td>
<td>1850</td>
<td>30.1</td>
<td>30.1</td>
<td>30.1</td>
<td>30.1</td>
<td>30.1</td>
<td>30.1</td>
<td>30.1</td>
<td></td>
</tr>
<tr>
<td>(F)</td>
<td>30.1</td>
<td>30.1</td>
<td>15,316</td>
<td>30.1</td>
<td>30.1</td>
<td>30.1</td>
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Theoretically, requesting permission from landholders to hunt is an uncomplicated, attractive procedure for gaining access to lands. Practically, however, there are complications. The major one is identifying the landholder. The Division of Wildlife Resources could simultaneously aid landholders and hunters by providing landholders with "Hunt by Permission Only" signs preprinted with name, address and telephone number at the landholders' discretion.

Alternative conditions (B), (D) and (E) would be useful in increasing land available to hunters. Condition (B) would require sportsmen to review the constitutions and policies of their respective organizations stressing the development of a higher quality hunter. Category (E) is probably too extreme for average upland game hunters, and the reduced emphasis from landholders for this category may indicate they realize its limitations.

Responsibilities of the State

Of the 5 individual conditions considered, only one, condition (C) furnish proof of having recently passed a state administered firearm safety examination prior to licensing, would be the direct responsibility of the Division of Wildlife Resources. The desire of the landholders for requiring firearms safety examinations does not indicate a dissatisfaction with the present Hunter Safety Program. Landholders may accept the program as being useful but favor extending the program beyond simply educating novice hunters.

Landholders are more concerned about having the quality of hunters improved than reducing the number of hunters. Individual hunters should be
concerned about their abilities as hunters and activities as sportsmen. It remains, however, for the State to establish and maintain a satisfactory quality control system. Success of present hunter safety programs, and the long term success of strict licensing procedure effective in Germany, testifies to the positive influence of properly administered educational programs. Lindzey and Wingard (1970, p. 145) expressed the need to have "... sportsmen participate in mandatory educational programs as part of the licensing procedure . . .." Decker (1971, p. 44) reemphasized the need for active hunter training programs involving "... correct methods of hunting, sportsmanship, landowner relations and the tradition of hunting."

Landholders have shown a definite desire for hunters to be physically capable and well educated in firearms safety. In exchange for upgrading hunter quality, at least 2.4 percent of the northern landholders who presently restrict hunters by posting "No Hunting" or "No Trespassing" would open their lands.

An additional condition which the Division of Wildlife Resources could consider is establishing a hunter allotment system based on the amount and location of available land. Programs of this nature contain inherent complications and would undoubtedly be more expensive to administer than present programs. Complications and expenses might be minimized by effecting the program for only the first week of the season, or perhaps just the opening weekend. Experimentation with different variations would be necessary. A program of this nature could open approximately 2.8 percent (2921 acres) of northern Utah lands
studied and 0.5 percent (140 acres) of the study area in the southern Utah counties presently posted "No Hunting" or "No Trespassing."

Accuracy of predictions

When considering the previous information, it should be remembered that acreage adjustment calculations were based on empirical evidence. Ultimately, one must question the reality of such estimates. Actual landholder participation might not be in accordance with aforementioned predictions.

Predictions based on statements of intent are subject to influences from which the potential for error can be substantial. Human behavior has been expressed as:

\[ B = f(P, E) \]

where

\[ B = \text{Behavior}, \]

\[ f = \text{Function} \]

\[ P = \text{Influence of all inner determinants, and} \]

\[ E = \text{Influence of all external (environmental) factors.} \]

Realized behavior (B), then, is a function of all influences internal (P) and external (E) affecting a person (Lewin, 1936). Because of this, a one-to-one correspondence between expressed intent and realized behavior is not always achieved.

Selltiz, Jahoda, Deutsch and Cook (1959) list confidence of respondents in their anonymity as one of the major advantages of questionnaire surveys. Additionally, questionnaires subject respondents to less pressure for speed in
answering, thus allowing a more detailed appraisal of the situation and a more realistic answer. Increased anonymity and relative freedom of response time serve to minimize near-term effects of (P) and (E).

It has been well documented that questionnaire surveys—especially mail surveys—sample a more partisan segment of the population than do interview surveys (Selltiz et al., 1959). Forty-nine percent of the respondents used stringent restriction techniques, e.g. either "No Hunting/No Trespassing" or charging a fee for hunting. Only 9 percent of the sample used mild restriction methods ("Hunt by Permission Only"). Over half the respondents (58 percent) had some form of hunter access restriction in force at the time of the survey. Within this group, 84.5 percent used strict restrictions. To obtain inaccurate results with a sample so biased would have required respondents to make an expression of behavior contrary to their actual behavior and contrary to what they perceived as being vital to their future welfare (Smith, 1975)—a rather unlikely situation.

LaPiere (1934), in a classic study of attitude expression versus behavior, noted essentially no relationship between what people list on a questionnaire (expressed attitude) and what they actually do when confronted with the situation (behavior). Ninety-two percent of the respondents (hotel/restaurant owners) stated they would not accommodate orientals. During the behavior tests with the same respondents, only one rejection out of 251 encounters was recorded. LaPiere's explanation of this situation was that responses to the questionnaire represented the owner's reaction to a symbolic situation where they were able to control both
internal and external factors and choose those factors which they believed best represented the collective expressions of hotel/restaurant owners (the reference group). When actually confronted by orientals seeking accommodations, respondents were no longer able to control external factors and, as shown by the results, these factors had a profound influence on behavior.

The situation in this study was similar to LaPiere's except landholders and upland bird hunters were used in place of hotel owners and orientals. An additional variable needs to be considered in this situation because it represents an influential component of inner determinants--the landholder's reaction to his perception of potential for damage to property or injury to him or his family from hunting accidents. The expressions of intended behavior analyzed here probably represent the most conservative expressions of each landholder consistent with the norms of his reference group (Utah farmers and ranchers).

Effects from errors in analysis must also be considered. These can be classed as either random (those errors, the effects of which vary from one measurement to another) or constant (systematic errors that affect all measurements to the same extent). Effects from random errors in expression of intended behavior were minimal. One external check used was a "Before-After" test of attitude. This test showed no statistical difference between respondent attitude toward hunting measured by a Likert Index in the original survey and attitude toward hunting measured by a Likert Index in a follow-up survey administered 9 months later. Respondents were able to follow and interpret the information within the questionnaires consistently.
Effects of constant errors also appear to have been minimal. Of northern landholders, the highest percent of response (60.6 percent) to questions of intended land restrictions came from landholders in highly urbanized counties. These counties suffered heavy hunter use, high proportions of access restrictions, and high degrees of landholder–hunter conflicts. These conditions notwithstanding, only 2 percent of these landholders chose to maintain their lands closed to hunters regardless of incentives.

It is beyond the scope of this study to make a numerical estimate of the validity of the acreage adjustments for Figures 2 and 3. Very little research has been done in the area of validating responses to social surveys regarding expressions of intended behavior (Lansing, Ginsburg and Braaten, 1961; Clark and Tifft, 1966). Smith (1975) did an exhaustive literature search on this topic and based on the findings published in the literature he concluded:

1. There will be reporting error even with the most "obvious" behavioral questions.

2. High accuracy rates can be associated with a low frequency of behavior.

3. Items related to the individual's current behavior tend to be more accurate.

4. Memory does not appear to be a strong source of error in comparing responses to similar questions over a period of time.
5. Finally, almost every one of the studies explains over-reporting or under-reporting of behavior in terms of making reported behavior compatible with social norms.

Of most importance here are conclusions (1) and (5). Size of errors in the studies published varied from 5 to 15 percent (Smith, 1975). The point of interest is whether landholders have over-stated or under-stated their intentions. It is thought that they have over-stated. There is no utility in under-stating intentions to restrict access when the restrictions are intended as protection against damage. Thus, it is conceivable that acreage realized could be as much as 15 percent higher than predicted. It seems only prudent to treat the data as representing maximum adjustments, and any acreage beyond that should be considered serendipitous. Inner determinants (P) were sufficiently considered. External factors (E), while considered, were subject to change for each respondent according to his perception of the norms (LaPiere, 1934). These external factors will also be the most difficult to control during application of processes previously described. The factors will include such characteristics as physical appearance, manner of approach, and credentials of the individual hunter seeking access privileges; any given set of these factors may have different appeal for different landholders. This area of study remains open for future investigations. For the individual hunter, success in acquiring access to restricted lands is directly dependent upon minimizing negative external influences.
Comparison of northern and southern landholders

There were 4 major areas of difference between northern and southern Utah landholders. 1) Southern landholders showed substantially less interest in upland bird hunting, and also restricted hunter access independently of their own hunting interest level. 2) Southern landholders controlled a greater amount of agricultural land per landholder, and there was no relationship between land controlled and restriction policy. 3) Southern landholders saw less hunter damage and abuse, and again, there was no relationship with restriction policy. 4) Southern landholders had statistically the same degree of familiarity with the recreation provision of the Agricultural Act of 1970 as had northern landholders. They did, however, restrict hunter access independently of this knowledge.

All of these differences are consistent with present knowledge of the two areas and point directly to the idea that stringent hunter restrictions are at least partially a result of concentrated hunter activity.

Landholder Attitudes Toward Hunting

Arguments concerning attitude scaling techniques are varied and have been waged within the disciplines of Psychology and Sociology for many years. The Likert Index used in this study is an ordinal scale and, as such, is not suitable for the quantitative assessment of the intensity of attitudes. It is, however, satisfactory for the arrangement of attitudes according to broad categories (ordering).
Attitude scores from landholders in the six northern counties were categorized according to the amount of industrialization of their areas. Landholders from northern industrial counties scored low while landholders from northern agricultural counties and from southern counties scored higher. The attitude of Utah landholders toward hunting was definitely favorable.

Is the score from the attitude index useful in predicting landholder reactions toward hunter access to private land? The results of this study indicate it is not. No correlation ($\alpha = 0.05$) was found between the Likert scores and landholder tendencies to restrict hunter access. However, by stratifying the restriction category, a significant ($\alpha = 0.05$) relationship was noted. Landholders from northern and southern counties having high Likert scores tended to select the "Hunt by Permission Only" method of restriction, and landholders with lowest scores selected the "No Hunting" or "No Trespassing" method.

Landholder's attitude toward hunting was not significant in terms of assisting him with the decision whether or not to restrict hunters. However, once the decision had been made to restrict hunter access, the landholder's attitude toward hunting contributed significantly to selecting the method of restriction.

Attitudes are, "... a predisposition to behave ..." in a particular fashion given specific stimuli. Actual behavior need not be in accord with assessed attitude (Lewin, 1936). Furthermore, attitudes are not static and are subject to change over time; in many instances change will be dramatic and time short.
As a resource management tool, attitude assessment is useful primarily as an index to public "pulse" (sentiment). Its value is in providing an estimate of the proportions of the public predisposed—favorably, undecided and unfavorably—toward various projects proposals, etc. Having this information it remains the option of the resource agency to apply the proper stimulus to elicit the desired response. Modification of management programs in accordance with attitudes may occasionally be justified. Management programs designed with heavy reliance on user attitude should be very critically evaluated and not accepted as being inherently sound.

Probably the most useful application of attitude assessment would be as an aid in planning information and education presentations. Since the basic purpose of these presentations is to alter or control the internal determinants (P) of behavior, attitude assessment would provide a gauge to the relative success of these attempts.

**Philosophical Considerations**

Exploratory research such as this study functions to identify specific problems. Solutions to these problems are attempted through application of experimental research. With either research technique, social problems dealing with human behavior are difficult to resolve.

Landholder-sportsman problems are problems in group behavior (social psychology). They may result from confrontations between individuals, but the ramifications extend to societal levels, e.g. landholders as a group versus
sportsmen or outdoor recreationists as a group. By definition, solutions to problems of this nature dictate consideration of collectives in lieu of individuals. Laws can be legislated governing interactions of resource oriented groups; but, to be effective, these laws must be embraced by society. So too, solutions to landholder-sportsman problems. Adoption of appropriate solutions begins by legitimizing these solutions with key individuals within the group (collectives), but ends successfully only if they are accepted as norms (standards) of the group.

This approach seemingly subverts American tradition which emphasizes individual freedoms. Instances of subjugation of the individual to the group occur as standard practice in every-day lives of citizens in our society, i.e. mandatory school attendance, restriction of certain age classes from voting, driver licensing requirements, etc. Learning and accepting which freedoms are permitted and which are not is acculturation. Altering permissible freedoms is social change. Change within society is always resisted (and therefore a rather slow process) because it reduces (until it is accepted as a norm) the predictability of the results of encounters between individuals and groups. Change is most often accomplished with relative ease in situations where it is immediately apparent to group leaders and the membership that the proposed change is beneficial. Demonstration of "benefit" of proposed programs is usually accomplished through education of group leaders. Display to the population of the "facts" associated with proposed change does not necessarily lead to rapid or successful adoption.
American hunters should realize their recreation activity is not a right granted by the Constitution, but a privilege legislated by state governments. Periodic changes in the rules governing granting of hunting privileges will be necessary. Some management proposals might not have obvious benefits for hunters, especially in view of individual freedoms. These will be the most difficult to legitimize with groups; consequently, they will require a considerably more elaborate presentation and a longer period for acculturation.

It appears highly unlikely that the American system of permitting private ownership of land and public ownership of game will change in the foreseeable future. Resource managers should be aware that the majority of landholders with which they work have an interest in both issues, thus disputes over game harvest on private land are unusually difficult to settle. Landholder-hunters will not always envision themselves as subject to the same hunting regulations (licensing, harvest, etc.) as "other" hunters. For decisions involving protection of property (crops, stock, buildings, etc.) it is most advantageous for them to view the situation from a landholder point of view; for decisions involving hunting, from a hunter point of view. How does a landholder-hunter approach decisions involving regulation of game harvest on private property? The complete answers is as yet unknown. Potential for extreme reactions—positively or negatively—is maximum in these instances. For this reason, proposals concerning hunting regulation changes should be approached with caution, presented in such manner as to permit sufficient time for legitimization.
CONCLUSIONS

Validation of Hypotheses

Not all demographic and behavioral characteristics proved of significant value in relation to landholder restriction practices as specified in Hypothesis (1): "Significant relationships exist between the restriction practices of landholders and selected demographic and behavioral characteristics." Relationships did exist between restriction practices and:

1. Assessment of the incidence of abuse and hunter-caused damage. As incidence of abuse and damage rose, restriction practices became more severe.

2. Acreage controlled. Landholders were most likely to use "No Hunting" or "No Trespassing" on parcels of land up to 200 acres; beyond this less strict methods were used. This should not be interpreted as meaning more huntable land will become available as farm size increases. Data from this study do not reflect changes in farm management philosophy attendant with the change in ownership. Farms in the future will not be proprietorships but corporate.

3. Location of property within Utah. Landholders in northern counties restricted hunter access more than expected, while southern county landholders restricted much less than expected.

4. Neighbor restriction practices. Landholders, in areas where restricting access was unanimous, favored the "Hunt by Permission Only" restriction.
5. Holding office in agricultural and/or sportsman group. Landholders who served as officers tended to be less restrictive of hunter access than those who had not been officers.

6. Attitude toward resource agency. Landholders were more moderate in restriction policies as attitudes increased in favor of programs provided through the resource agency.

Utah landholders expressed attitudes favorable toward hunting showing that hypothesis (2) is valid, i.e.: "Utah landholders have an attitude toward hunting that is predominantly favorable."

Hypothesis (3) was not validated which stated that "There is significant relationship between landholder attitude toward hunting and the restriction of hunters from private property." Attitude toward hunting did not have a significant influence in the decision to restrict hunter access to private land. However, it did exert a significant influence in the decision by what method restriction would be accomplished. For landholders who restricted hunter access, the more favorable the attitude, the milder the restriction technique.

Of the 20 landholder demographic and behavioral characteristics correlated with attitude toward hunting, only four appear to be useful for attitude prediction on a state-wide basis. Hypothesis (4), "Significant associations exist between landholder attitude toward hunting and selected demographic and behavioral variables," was not entirely validated.
Statement of Conclusions

1. There was a significant relationship between landholder restriction practices and several demographic and behavioral variables.

2. Utah landholders expressed attitudes favorable toward hunting.

3. Attitude toward hunting did not have significant influence in the decision to restrict hunter access to private lands.

4. Attitude toward hunting did exert an influence in the decision of the technique for restricting access.

5. Attitude toward hunting can be predicted with limited success from knowledge of certain demographic and behavioral variables.

6. Communication between the resource agency and private landholders on matters of maintaining hunter access to private lands was low during the course of this study and the preceding 5 years.

7. There were several conditions under which Utah landholders would have permitted hunter access to restricted lands. The most important was for hunters to request permission for such access.

8. Landholders in northern counties wanted numbers of hunters per unit area reduced and the quality of hunters upgraded.

9. It appears that success of hunters in acquiring access to restricted lands will depend upon keeping negative external influences to a minimum.

10. Obtaining access to restricted lands in the future will require more effort from hunters to establish themselves as responsible recreationists.
RECOMMENDATIONS

A portion of the recommended management activities included herein result directly from the response of landholders to questions involving hunter access to private land. Additional recommendations are based on interpretation of attitude and demographic data integrated with findings from similar studies completed elsewhere in the United States. These are included as suggestions for courses of action which appear appropriate under conditions existing during the course of the study and for anticipated future conditions. The final decision whether to accept some or all as integral portions of management plans or experimental programs, or simply categorize them as inappropriate and reject them rests with the resource management agencies.

Near-Term Recommendations

1. Sportsman's clubs as well as individual hunters should assume more responsibility for preventing hunting damage to private property. Presumably, landholders would favor resource management agencies exerting their influence on hunters to expedite the necessary changes.

2. Because of the general lack of correlation between attitude scale results and realized behavior, attitude information should be utilized as an index to progress rather than as the basis for management projects. The possible exception would be for programs in human behavior modification, i.e. it would be an asset to information and education departments.
3. Resource management agencies could include as part of their management packages, programs specifically designed to communicate to the private landholder, information concerning present management activities, proposed activities, availability of government (federal and state) aid to wildlife management on private land and how these activities will aid wildlife and landholders. An example of such communication is the series of articles by Nish (1974), "Phacts Phrom the Pheasant Phactory." These programs should be designed to encourage and utilize feedback from landholders. In this regard, personal contact between landholders and resource managers is highly desirable.

4. Resource management agencies could experiment with hunter allotment programs to reduce chronic hunter density problems. Such programs would be especially desirable in urbanized counties to alleviate crowding associated with opening day and opening weekend phenomena.

5. Hunters could be made aware that there are conditions under which considerable acreage could become available for hunting. Success in obtaining access to these lands depends on the initiative of the hunter and his ability to create a favorable impression with the landholder.

6. Further investigations in landholder-sportsman problems are necessary. Five areas for experimental research are (a) economics and comparative efficiencies of popular hunter restriction techniques, (b) effectiveness of programs offered by sportsman clubs for establishing in their members' sound philosophies of sportsmanship and hunter ethics, and high quality hunting skills, (c) evaluation of external factors used by landholders when granting access privileges to
restricted lands, (d) evaluation of landholders perception of their role as private wildlife managers, (e) evaluation of compensation to landholders for permitting hunter access.

**Long-Term Recommendations**

1. Non-urbanized states might profit by following the lead of several urbanized states and require all first season hunters, regardless of age or previous hunting experience in other states, to complete a hunter safety course prior to licensing. It might be advantageous to enter into reciprocal agreements with other states having similar regulations especially to alleviate problems with non-resident hunters.

2. Hunters should be required to pass periodic physical tests prior to licensing. This need not be on an annual basis, the time period between tests and the extent of the tests would be determined by the resource management agency. Tests might be conducted in conjunction with driver licensing to ease administrative difficulties.

3. Resource management agencies could increase efforts to display hunting as a safe, respectable, legitimate outdoor recreation activity emphasizing the outdoor experience—not the harvest.
SUMMARY

This study was designed as an exploratory study to provide information concerning the restriction of hunter access to private property and landholder attitudes toward hunting.

Data were collected by mail questionnaire from six northern and five southern Utah counties. Two questionnaires were used: 1039 were returned with usable information (2076 distributed). The main test questionnaire was mailed immediately following the close of the 1971 upland bird season. In August 1972 a second questionnaire was mailed to those landholders responding to the original. The purpose of the second questionnaire was to gather data to test for changes in attitude and intended restriction policy. Return rates for both questionnaires were approximately 50 percent. Analyses were conducted by computer using the SPSS program described by Nie, Bent and Hull (1970).

A review of the findings showed the majority of Utah landholders favor the concept of hunting. Northern landholders in industrialized areas had the highest incidence of undecidedness among all landholder categories. There was no significant relationship between landholder attitudes toward hunting and hunter restriction policy. However, attitude toward hunting was important in determining by what methods landholders restricted hunter access. Those with low attitude scores (unfavorable attitudes) tended to post "No Hunting" or "No Trespassing." Landholders with favorable attitudes tended to use the "Hunt by Permission Only" restriction.
Items that were significantly correlated with attitude scores were the landholder's upland bird hunting interest, his attitude toward hunting regulation enforcement and attitude toward management of upland bird populations. For northern Utah landholders there was also a high correlation between the acres of silage raised and the basic attitude scores. For southern landholders the correlation was between acres of produce and attitude scores. In both instances the correlation was negative, i.e. the higher the acreage, the lower (more unfavorable) the attitude score.

Approximately 32 percent of the land controlled by northern landholders and 81 percent of the land controlled by southern landholders was available in 1971 for hunting with no restrictions. Of the lands closed to hunting, 19.6 percent and 4.7 percent were restricted under "No Hunting" or "No Trespassing" regulations in northern and southern counties respectively. Several procedures could be utilized by individual hunters to improve access to restricted land. The single most effective procedure would be for the hunter to request permission from the landholder to hunt on his property.

Of 16 demographic and attitude variables compared with landholder restriction practices, 10 had statistically significant relationships at the 90 percent level or higher. These relationships suggested the landholders' prime motivation for restricting hunter access was the desire to protect their investments in buildings, equipment, livestock or crops.

Comparisons of restriction practices between northern and southern Utah landholders revealed that southern landholders have less interest in upland bird
hunting, controlled a greater amount of agricultural land per landholder and saw less damage and abuse from hunters. The implication from these differences was that stringent hunter restrictions resulted in part from concentrated hunter activity.

For the immediate future, landholders desire (above all considerations) hunters to assume more responsibility for preventing damage to private property. The exact mechanism by which the assumption of responsibility will occur is unknown. Several techniques have been proposed—more involved licensing procedures, mandatory hunter insurance programs, opening day area allotments for hunters, etc.—few have been tested. From a resource agency point of view, perhaps the first step would be to establish an aggressive communication program directed toward landholders.
LITERATURE CITED


Arnett, G. R. 1972. Profit by our experience! Proceedings of the 52nd Annual Conference of the Western Association of Game and Fish Commissioners. 52:46-56.


McIntosh, K. D. 1967. Posting of land in West Virginia and landholder attitudes regarding posting, hunting fees, and the hunter. West Virginia University Agricultural Experiment Station Bulletin 542. 40 p.


______. 1971. How will we handle future hunting and fishing?--From the conservation agency viewpoint. Proceedings of the 51st Annual Conference of the Western Association of Game and Fish Commissioners. 51:20-23.


Utah Department of Fish and Game. 1957. A study of the economic value of fishing and hunting in Utah. Publication 7. 73 p.


APPENDICES
Appendix A

Questionnaire Used in Study

ALL INFORMATION IN THIS QUESTIONNAIRE IS CONFIDENTIAL
AND WILL NOT BE ASSOCIATED WITH YOUR NAME IN ANY WAY

For each of the statements below, please fill in the number that most nearly corresponds with your feelings. Mark:

0 - if you Strongly Disagree
1 - if you just Disagree
2 - if you are Undecided
3 - if you Agree
4 - if you Strongly Agree

Example:

4  Vanilla ice cream is good. (Vanilla is my favorite so I Strongly Agree.)
0  Drunk drivers are safe drivers. (Here I marked 0 to Strongly Disagree.)

Please complete all the statements.

Hunting is a privilege not a right.
I feel obligated to permit upland bird (pheasants, chukars, doves, etc.) hunters free use of my land.
The sport of hunting is causing the extinction of our wild animals.
Hunting is a wholesome form of outdoor recreation.
Hunting serves no useful purpose.
One way to acquire an appreciation for wild animals is to hunt them.
Hunting is part of the American way-of-life.
There is more to hunting than just bagging your limit.
Hunting is a cruel, inhumane sport.
The sport of hunting should be made illegal.
Hunting offers people the opportunity to enjoy the companionship of friends.
Hunting is not a dangerous sport.
The number of small game licenses sold should be limited.
Periodic sight and hearing tests should be required of all hunters.

The following questions deal in a general way with the history of the posting of private land in your county. Feel free to comment either in the spaces provided or at the end of the questionnaire.
1. Approximately what percent of your land was under the following restrictions for upland bird hunters this year (1971)?

- [ ] % Land open under some type of fee system.
- [ ] % Land in Pheasant Hunting Unit.
- [ ] % Land leased to a Private Club.
- [ ] % Land posted NO HUNTING or NO TRESPASSING.
- [ ] % Land posted HUNTING BY PERMISSION ONLY.
- [ ] % Land open to upland bird hunting—no restrictions.

2. (A). How long have upland bird hunters been restricted from your land?

- [ ] Years Comments

(B). How long have upland bird hunters had unrestricted access to your land?

- [ ] Years Comments

3. (A). Do your adjacent neighbor landholders restrict upland bird hunters from their land in any way?

- [ ] Yes, some do  [ ] Yes, all do  [ ] No, none do

(B). If yes, please indicate the ways in which they restrict access. (Check all that apply).

- [ ] Land open under some type of fee system.
- [ ] Land used as a Shooting Preserve.
- [ ] Land in Pheasant Hunting Unit.
- [ ] Land leased to a Private Club.
- [ ] Land posted NO HUNTING or NO TRESPASSING.
- [ ] Land posted HUNTING BY PERMISSION ONLY.

4. (A). In the past 5 years how often have sportsmen's clubs or individual hunters offered you assistance with your farm/ranch work?

<table>
<thead>
<tr>
<th>Sportsmen's Clubs</th>
<th>Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>A few times</td>
</tr>
<tr>
<td>Just once</td>
<td>Often</td>
</tr>
</tbody>
</table>

(B). In the past 5 years how often have sportsmen's clubs or individual hunters offered to do conservation work on your land?

<table>
<thead>
<tr>
<th>Sportsmen's Clubs</th>
<th>Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>A few times</td>
</tr>
<tr>
<td>Just once</td>
<td>Often</td>
</tr>
</tbody>
</table>
5. (A). How well do you think the State Division of Wildlife Resources is enforcing the hunting regulations during the upland bird season?

- They are doing an excellent job.
- They are doing a good job.
- I don't know.
- They are doing a poor job.
- They are doing a terrible job.

(B). How do you think the enforcement of hunting regulations can be improved?

6. Some landholders restrict access to their land only during certain hunting seasons. During what upland bird seasons are hunters restricted from your land?

- Never restricted
- Always restricted
- Restricted only during pheasant season
- Land posted OPEN FOR PHEASANT HUNTING for extended season
- Land posted NO HUNTING, NO TRESPASSING, or CLOSED TO PHEASANT HUNTING, after opening day to reduce season length
- Restricted only during dove season
- Restricted other than above, specify below

7. If you restrict upland bird hunters by posting or are planning to do so, please check the reasons for it. (Check all that apply.)

- Upland bird hunters are destructive to property or livestock.
- Upland bird hunters are abusive and inconsiderate.
- Upland bird hunters are careless with firearms.
- To control the number of hunters.
- Neighbor landholders wanted me to.

Please list any other reasons
8. (A). Please mark the conditions that you feel MUST be met before you would permit an upland bird hunter to hunt on your land.

a ___ If he asks my permission.
b ___ If I know him personally.
c ___ If he helps me with farm/ranch work.
d ___ If he pays me a fee.
e ___ If he belongs to an organization that will repair or compensate me for damages he causes.
f ___ If he had to pass firearms safety tests before he could buy a license.
g ___ If he provided me with some resources (money, feed, labor, etc.) for raising game.
h ___ If he were required to carry liability insurance to cover damages and injuries.
i ___ If he would show some friendship after the hunting season.

Please list other conditions important to you.

h ___ If he were required to carry liability insurance to cover damages and injuries.

i ___ If he would show some friendship after the hunting season.

j ___ If he would share his bag with me.

k ___ Under no conditions would I permit an upland bird hunter to hunt on my land.

(B). If you marked more than two conditions, circle the two most important to you.

a b c d e f g h i j k

9. In the past 5 years, have representatives from the State Division of Wildlife Resources (wildlife biologists, conservation officers, etc.) asked your opinion about how to keep private land open for public hunting?

___ A few times. ___ Often each year.

___ A few times each year. ___ Never.

10. Whom do you think should have the primary responsibility for preserving access privileges to private land for upland bird hunters?

___ Federal Bureau of Sports Fisheries and Wildlife

___ U.S. Department of Agriculture

___ State Division of Wildlife Resources

___ Sportsmen’s clubs

___ Individual sportsmen/hunters

Please specify any others.
11. (A). Please mark the conditions that you feel organizations or groups MUST meet before you would permit upland bird hunters to hunt on your land.

a. If organizations would arrange to lease my land for hunting.
b. If organizations would supply me with resources (feed, money, labor, etc.) to raise game.
c. If organizations would guarantee their members to be responsible, safe hunters.
d. If organizations would guarantee to repair or compensate me for damages their members cause.
e. If a responsible administrative agency were granted the authority to hold organizations responsible for the damage their members cause.
f. If signs and services for posting Safety Zones were provided free of charge.
g. If readily available (on-call) law enforcement services were provided for hunting regulation violations.
h. If hunting seasons were more closely adjusted to our crop harvest.
i. If services were provided to permit only a safe and reasonable number of hunters on my land.
j. If a suitable means were available to limit the number of upland bird hunters licensed.
k. There is nothing any organization can do to gain hunting privileges on my land.

Please list any other conditions important to you.

____________________________________________________________________________________

(B). If you marked more than two group conditions, circle the two most important to you.

a b c d e f g h i j k

12. Are you familiar with the provisions of the Agricultural Act of 1970 regarding benefits from recreational use of farm lands?

_____ Yes  _____ Only slightly  _____ No
13. (A). What kind(s) of damage was done to your property or livestock this season (1971) and last season (1970)? (Check all that apply.)

1971 1970
____ Cut or ruined fences. ___
____ Signs ruined. ___
____ Animals badly frightened. ___
____ Animals killed. ___
____ Machinery damaged. ___
____ Buildings damaged. ___
____ Crops ruined. ___
Please specify any other damages.

(B). What has been the incidence of damage over the past 5 years?
____ Increasing  ____ Decreasing  ____ About the same

14. (A). What types of abuse or inconsiderate acts were received by you, your family or employees from upland bird hunters this season (1971) and last season (1970)? (Check all that apply.)

1971 1970 1971
____ Name calling  ___ Gates left open ___
____ Threats  ____ Hunting without permission ___
____ Bodily injuries  ____ Littering ___
Please list any other acts.

(B). What has been the incidence of abuse or inconsiderate acts over the past 5 years?
____ Increasing  ____ Decreasing  ____ About the same

15. Have you participated in any Federal Agricultural Cost-Sharing Programs during the past 5 years?
____ Yes  ____ No

16. If you post your land NO HUNTING or NO TRESPASSING, or if you usually charge a fee, do you let anyone hunt or hunt free of charge on your land?
____ Yes, relatives  ____ Yes, neighbors
____ Yes, friends  ____ No, no one
17. What do you think will be the availability of your land for hunting next hunting season (1972)?
   ___ Unrestricted as this season
   ___ Restricted as this season
   ___ Changed to NO HUNTING or NO TRESPASSING
   ___ Changed to Pheasant Hunting Unit
   ___ Changed to Private Club
   ___ Changed to fee hunting
   ___ Changed to Shooting Preserve

18. (A). In your opinion, how well is the State Division of Wildlife Resources managing the upland bird populations?
   ___ They are doing an excellent job.
   ___ They are doing a good job.
   ___ I don't know.
   ___ They are doing a poor job.
   ___ They are doing a terrible job.

(B). How do you think the management of these bird populations can be improved?

________________________________________________________________________

19. (A). If you charge a hunting fee or if you have your land in a Pheasant Hunting Unit please indicate the reasons for doing so. (Check all that apply.)
   a. ___ To control the number of hunters
   b. ___ To pay for damages from hunting
   c. ___ To earn extra income
   d. ___ Hunters should pay to use private property
   e. ___ To pay for damages from wildlife
   f. ___ My neighbors do
   g. ___ Hunters wanted me to
   h. ___ Hunters don't do as much damage when they pay or when land is in a hunting unit

Please list any other reasons

________________________________________________________________________

(B). Which one of the above reasons do you feel is the most important?
   a b c d e f g h (circle one)
The following questions are asked so that we may compare the various characteristics of landholders according to certain counties in Utah. All information will be used in the form of statistical tables and WILL NOT be associated with your name in any way.

20. Were most of your younger years (up to 19) spent in:
   _____ A city area
   _____ A suburban area
   _____ A rural area

21. Approximately how old were you when you moved to a rural area?
   _____ Years old

22. About how many years have you been involved with farming/ranching (include work as a child)?
   _____ Years

23. (A). Do you earn your total living from Agriculture?
    _____ Yes    _____ No

   (B). If no, please list your other occupation (job title).
    ______________________________________________________

24. (A). In which types of organization are you a member? (check all that apply.)
   _____ Agricultural (Farm Bureau, Cattlemen's Assoc., Wool Growers Assoc., etc.)
   _____ Sportsmen or Conservation (Wildlife Federation, Rod and Gun Clubs, etc.)

   (B). In which types of organization are you or were you an officer (elected or appointed)?
   _____ Agricultural
   _____ Sportsmen or Conservation

25. Which types of magazines do you read regularly? (Check all that apply.)
   _____ Agricultural
   _____ Sportsmen, Outdoor (American Rifleman, Sports Afield, etc.)
   _____ Conservation (National Wildlife, etc.)
26. How would you classify yourself as an upland bird hunter?

___ I really enjoy it and go out of my way to hunt upland birds.
___ I really enjoy it but like other types of hunting about as much.
___ I enjoy it but like other types of hunting more.
___ I don't enjoy hunting upland birds or I don't hunt.

27. Please rank the following media in order of their importance to you as sources for wildlife, conservation, or hunting information. (Mark the most important source as 1, the next most important as 2 and so on.)

___ National outdoor magazines (Outdoor Life, American Rifleman, etc)
___ Newspapers
___ Radio
___ Publications (magazines, bulletins, pamphlets) from conservation organizations such as State Fish and Game Depts.
___ Conservation agency personnel (biologists, conservation officers, etc.)
___ Television

28. What schooling have you completed?

___ 0-8 years grade school
___ 1-3 years high school
___ Graduated from high school
___ Graduated from technical school
___ Attended college
___ Graduated from college

29. Approximately how much agricultural land do you control (include land that you own and/or lease but not land held in federal grazing permits)?

___ 20-60 acres
___ 61-120 acres
___ 121-200 acres
___ 201-400 acres
___ 401-800 acres
___ 801-1,200 acres
___ 1,201-1,600 acres
___ Over 1,600 acres

30. How would you suggest the numbers of hunters using private land be regulated?
31. Roughly what percent of your total agricultural land is used for the following crops?
   _____% Cut for hay only
   _____% Grazing only
   _____% Cannery crops (peas, beans, etc.)
   _____% Cereal and/or feed grain (wheat, oats, etc.)
   _____% Silage crops
   _____% Produce (potatoes, onions, etc.)
   _____% Sugar beets
   _____% Misc. (Christmas trees, horticultural products, etc.)

32. What do you feel is needed to maintain public hunting on private land?

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________

Please feel free to comment on anything covered in this questionnaire or on something you think should have been covered.

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________
Appendix B

Cover and Follow-up Letters Used in Study
Dear Landholder:

If hunting is to survive as a form of public recreation it is essential that the relationships between sportsmen and landholders be friendly, sincere and mutually beneficial.

We are conducting a research study under the supervision of the Utah Cooperative Wildlife Research Unit, Utah State University. The purpose of this study is to contact landholders to obtain opinions about upland bird hunters, posting of private property, hunting fees and damages caused by upland bird hunters. From your answers, recommendations will be formulated that should be of benefit to both landholder and sportsman.

Since the number of private landholders in Utah is small, the opinion of each landholder is vital. We invite your personal participation in this study. Please answer all the questions and return the questionnaire as soon as possible, as analyses will begin on August 13, 1971. For your convenience, we have included a post-paid, self-addressed return envelope.

All information obtained will be strictly CONFIDENTIAL. There is a number printed on the back of the return envelope, to identify the county to which the questionnaire was sent. Please do not remove the number, without it the questionnaire is of less value.

Thank you for your assistance.

Respectfully,

Jessop B. Low,
Unit Leader

James R. Kitts
Graduate Research Assistant

Enclosure
Dear Utah Landholder:

Early in December, 1971 introductory letters and questionnaires concerning upland bird hunting were sent to landholders here in Utah. Information from returned questionnaires is being processed now. This processing will continue through early February, 1972.

We are sending a second questionnaire because we believe this project is extremely important to landholders and we want everyone to have an opportunity to participate. It is also possible that because of the confusion of Christmas and New Years your previous questionnaire might have been misplaced. Everyone's opinions are important and this will be your last opportunity to express your opinions to us before data analysis begins. Please complete the form and return it to us as soon as possible.

The results from this study should be available late this summer. If you would like your own copy of these results just send me a note and I will send you a copy, free of charge.

Thank you for your interest and cooperation.

Very truly yours,

James R. Kitts
Graduate Research Assistant
VITA

James Ross Kitts

Candidate for the Degree of

Doctor of Philosophy

Dissertation: Hunter Access to Private Land and Attitude of Utah Landholders Toward Hunting

Major Field: Wildlife Science

Biographical Information:


Education: Attended elementary school in Erie, Pennsylvania; graduated from McDowell High School, Erie in 1956; received a Bachelor of Science degree from Slippery Rock State College, with a major in Physical Education, 1961; received a Master of Science degree from Utah State University, with a major in Wildlife Biology, 1971; completed requirements for the Doctor of Philosophy degree specializing in Wildlife Science with a minor in Sociology at Utah State University, 1975.

Professional Experience: 1973 - present, Assistant Professor, Natural Resources Management Department, California Polytechnic State University; 1969-1970 (academic year) Teaching Assistant Department of Wildlife Science, Utah State University; 1965-1973, Graduate Student, Utah State University; 1962-1965 Officer, United States Navy; 1961-1962 (academic year) Teacher, Cochranton Joint Area Schools, Cochranton, Pennsylvania.