MONTANA BIOECONOMICS STUDY

A Contingent Valuation Assessment of Upland Game Bird Hunting

Hunter Attitudes and Economic Benefits

June 1992

Montana Department of
Fish, Wildlife & Parks

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A CONTINGENT VALUATION ASSESSMENT
OF UPLAND GAME BIRD HUNTING:

HUNTER ATTITUDES AND ECONOMIC BENEFITS

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Montana Department of Fish, Wildlife and Parks

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EXECUTIVE SUMMARY

The objective of the upland game bird hunter study was to estimate the net economic value of an upland game bird hunting trip. Estimates of net economic value were determined for a 1990 upland game bird hunting trip for the average hunter as well as for resident and nonresident hunters and "first" and "last" trip of the hunting season. Net economic values were also estimated for a hypothetically improved hunting condition. In addition resident and nonresident hunter expenditures are detailed along with hunter/trip characteristics, attitudinal and preference information, and opinions about selected upland game bird management issues.

The upland game bird questionnaire was mailed to 3,000 upland game bird hunters. The Dillman Total Design Method was used to administer this survey, resulting in a 74 percent response rate. This method requires sending an initial survey, a follow-up postcard, and if necessary a second survey. See Chapter II for details concerning the response rate and Dillman method. Since no follow-up of nonrespondents was conducted, it is not known if their responses were different from those hunters who responded.

Hunter and trip characteristics for resident and nonresident hunters differed in many areas. Nonresidents drove considerably farther than residents (755 vs. 58 miles), had higher incomes ($54,000 vs. $38,000), and a larger percentage belong to a hunting/conservation organization. Nonresidents also spent considerably more on their trip than resident hunters, see Table 8 for details. A detailed presentation of this information is found in Tables 2-6, Chapter III.

The valuation of upland game bird hunting was accomplished by asking hunters to respond to two contingent valuation (CVM) questions. The question format presented hunters with a straightforward "yes-no" situation on whether or not the trip was worth a predetermined bid amount randomly varied across questionnaires. Their answers provided the data to estimate the net economic value of upland game bird hunting.

Analysis of responses resulted in a net economic value of $149.00 for the complete sample. Net economic values for the resident/nonresident subsamples were $131.00 and $174.00 respectively. Chapter IV provides a detailed look at the estimation of the net economic values and Table 9 presents the benefit estimates for the various situations analyzed.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Scope and Objectives

The upland game bird hunter survey was designed to collect information from these hunters to: 1) estimate the net economic value of upland game bird hunting in Montana and, 2) better understand upland game bird hunters' reasons for bird hunting, their thoughts on upland game bird management in Montana, and provide a picture of these hunters from the socio-demographic data provided. A random sample of resident and nonresident upland game bird hunters were administered this survey.

A contingent valuation dichotomous choice format was used to elicit responses about the value of upland game bird hunting. Logistic regression models were then used to calculate the economic benefit estimates. Descriptive statistics were utilized in presenting the data on trip and hunter characteristics/attitudes and views on upland game bird management.

This report does not explore nonuse values that this resource provides. Nonconsumptive/nonuse values associated with upland game birds are not possible to estimate without the use of a general household survey. Literature suggests (Walsh et al. 1985) that these values may make up a large portion of the total value related to upland game birds.

Definition of Economic Benefits

The recreational opportunities that wildlife provide can be measured in an economic framework. The value of these resources, is the benefit derived from their use (upland game bird hunting in this case) and the benefits are generally non-monetary. Most goods and services are exchanged in defined markets and have prices established through this market exchange. The same economic principles that define a price for a marketed good apply for defining a price for nonmarketed resources.

When recreationist are asked if an activity is worth more to them than the amount they had to spend, many answer "yes". These people experience "net willingness to pay". Net willingness to pay is the additional amount a recreationist is willing to pay over and above what they actually have to pay for an activity. This net willingness to pay or net economic value is the measure of benefits associated with upland game bird hunting.

The U.S. Water Resources Council Principles and Guidelines (1983) require many federal agencies to use net willingness to pay as the measurement of value for both marketed and nonmarketed resources. The U.S. Department of the Interior also requires the use of this economic concept in determining losses and gains to society (U.S. Department of the Interior, 1986). The Bureau of Land Management uses net willingness to pay when evaluating the value

1

of wildlife in their cost benefit analyses. The use of net willingness to pay is also recommended in current economic literature (Just, Hueth and Schmitz, 1982).

Survey Design

The upland game bird survey was designed to gather a wide variety of information from the hunters. This information included hunting practices, views on upland game bird management, valuation of hunting experiences, and socio-demographic information. The questionnaire (See Appendix A) was arranged into five sections dealing with the following topics:

I.   General questions regarding respondents upland game bird hunting.

II.   Questions regarding the hunters first and last upland game bird hunting trips for 1990 season. Hunter and trip characteristics as well as hunter values.

III.   Economic questions about "first" or "last" hunting trip of the year for upland birds. Travel time and distance travelled, expenditure information and contingent valuation questions.

IV.   Question on upland game bird management.

V.   Socio-demographic questions regarding respondents age, sex, education, income, etc.

Two versions of the questionnaire were mailed to upland game bird hunters. Half the sample received surveys that had questions in sections III and IV that asked about their "first" hunt of the season while the other half of the sample were asked questions about the "last" hunt of the season. By dividing the sample in two in this manner the chances of biasing the results, if only the most recent trip information was collected, was minimized.

Sample Respondents and Survey Administration

The sample population selected to receive the questionnaire were people who had bought a 1989 upland game bird license and said they had hunted upland birds in 1989 on the big game harvest survey. The Total Design Method, Dillman (1978), was used for mailing out this survey. A cover letter, survey and stamped return envelope were mailed to upland bird hunters. One week later, a reminder postcard was mailed to everyone either thanking them for their input or asking them to complete and return the survey. Two weeks after the initial mailing a second cover letter and survey were mailed to those hunters who had not returned their questionnaire.

Response Rates

Three thousand surveys were mailed to resident and nonresident bird hunters. Ninety seven surveys were undeliverable. This left an effective sample of 2903. The sample was drawn from a population of upland game bird hunters who had responded they had hunted birds that season, no hunters said they had not hunted. Two thousand one hundred forty three (2143) hunters returned their surveys: a response rate of seventy four (74) percent. This response rate is similar to other economic valuation surveys conducted in Montana (Brooks,1988; Duffield and Neher, 1991).

Contingent Valuation Method

The two methods approved by the U.S. Water Resources Council (1983) for valuing outdoor recreation are the travel cost method (TCM) and the contingent valuation method (CVM). The contingent valuation method asks people their willingness to pay for a given good or service. The method is based on the concept that a realistic yet hypothetical market situation can be described to the survey respondents. This method has been used to value a variety of natural resources including scenic beauty, water quality, fisheries, and wildlife.

There are six key choices that need to be made regarding the application of a contingent valuation survey according to Bishop and Heberlein (1985). They are: 1) target population, 2) product definition, 3) payment vehicle, 4) question format, 5) method of analysis, and 6) supplemental data. In the case of this study, the target population was licensed upland game bird hunters who had indicated they had hunted birds. The product being defined was an upland game bird hunting trip. The payment vehicle needs to be emotionally neutral and appropriate; in this case increased trip costs associated with the bird hunting trip.

The question format used in this study was a closed-ended dichotomous choice approach (Bishop and Heberlein, 1979, Hannemann, 1984). This technique combines some of the better features of the open-ended and iterative bidding approaches. In the dichotomous choice the respondent is faced with a specific dollar bid and their response is a simple yes/no as in real market situations. The dollar bids are chosen beforehand and are randomly varied across respondents.

While there are advantages and disadvantages to all the techniques, the dichotomous choice format provides good approximations to actual market transactions (Welsh, 1986) and lends itself to mail questionnaires which are relatively inexpensive. The major disadvantage of this format is the complex analysis that is necessary compared to the other approaches (open-ended and iterative bidding formats). Duffield and Allen (1988) provide a detailed comparison of these techniques.

4

Willingness to pay using a dichotomous choice contingent valuation model.

The estimate of willingness to pay for upland game bird hunting is determined by finding the relationship between the bid amounts that hunters responded to and the odds of them saying they would pay that amount. This relationship is shown graphically as a two dimensional curve. The area under the curve from zero to some upper value is determined through mathematical integration and represents the expected maximum willingness to pay for an upland game bird hunting trip. The upper value is usually the highest bid level at which "yes" responses were recorded.

HUNTER CHARACTERISTICS AND MANAGEMENT PREFERENCES

The Montana Upland Game Bird Survey, 1990 provides information on hunters' socioeconomic characteristics, trip details, and upland game bird management preferences. In those areas where major differences occur, the information is reported by residency. Table 1 shows the size of the sample for these two groups.

Hunter Characteristics

As mentioned, the sample was broken down into resident/nonresident categories to observe their characteristics. When asked to rate upland game bird hunting compared to their other outdoor activities forty six percent (46%) of the resident hunters said it was their favorite or one of their favorite activities while fifty eight percent (58%) of the nonresidents felt this way. As Table 2 demonstrates, there are some major differences between these two groups. Nonresidents are generally older than their resident counterparts, have hunted upland game birds longer, have significantly higher average incomes ($54,600 vs. $37,800), and more of them belong to hunting/conservation organizations (65% vs. 39%).

Trip Characteristics

Upland game bird hunters were asked a number of questions about their hunting trips. As Table 3 shows, the differences between these two groups are in areas one would expect. Residents hunted fewer days per trip, had hunted the area for more years, took more trips to the area, and didn't for the most part hire a guide.

With the sample stratified by "first" and "last" hunting trip, comparisons could be made concerning this difference. There was not a major difference between the number of days hunted on the first and last hunting trip. When asked to check which upland birds they were hunting, there was no clear favorite during the "first" hunting trip. More hunters checked they were hunting pheasants than any other bird on the "last" hunting trip. While pheasants were the game bird of choice for both resident and nonresident hunters, more (60%) out-of-state hunters chose this bird than did the nimrods from in-state.

The equipment used by upland game bird hunters is far less extensive than for most other types of hunting. The most commonly used equipment was binoculars, cameras, and hunting dogs. Interestingly, less than 50% of upland game bird hunters reported using hunting dogs.

Bird hunters' behavior and motivation should be strongly related to the type of hunting experience they are seeking. Sampled hunters were asked eight questions (See Table 5.) regarding the reasons they hunt upland game birds and that reason's importance. The most important reasons for bird hunting related to being outdoors, being in a natural setting, and for the solitude. These were followed by reasons related to hunting i.e. to learn about upland birds, test hunting skills, and for the meat.

Hunters were also asked to rate the importance of nine reasons why they chose the area they did for their "first" and "last" hunt. As Table 6 shows the top reasons were lots of birds, few hunters, familiarity with the area, to be able to hunt with family and friends, a variety of upland birds and good public access.

Figures 1 and 2 shows the counties where at least fifty five percent (55%) of the resident and nonresident hunters pursued their winged quarry. Teton, Cascade, Fergus, and Flathead/Lake counties were the most heavily hunted by the sample of resident hunters. Nonresident bird hunters were most likely to hunt Sheridan, Fergus, Phillips or Big Horn counties.

Table 1.   Upland Game Bird Hunter Survey Sample Size.

Hunters	Sample Size	Percentage
Resident Hunters	1613	75%
Nonresident Hunters	<u>530</u>	<u>25%</u>
Total	2143	100

Table 2.   Upland Game Bird (UGB) Hunter Characteristics by Residency.

Characteristic	Resident	Nonresident
Years hunted upland game birds	19	23
Days hunted per year	11	14
Days hunted UGB in Montana	11	6
Average age	37	43
Average income	$37,800	$54,600
Percent male hunters	95%	98%
Percent belonging to a sportsmen organization	39%	65%

8

Table 3.   Upland Game Bird (UGB) Hunter Trip Characteristics.

Characteristic	Resident	Nonresident
Number of days hunted - "first trip"	1.8	4
Number of days hunted - "last trip"	1.7	3
Hours hunted	5.5	6
Other UGB hunters seen	2-5	2-5
Number of years hunted UGB is this area	10	6
Number of trips to this area this year	3-5	1-2
Did you hire a guide?	0.5%	12%

Table 4.   Equipment used by Upland Game Bird Hunters.

Equipment	Yes responses	Percentage
Binoculars	891	42%
Boat	45	2%
Hunting dog	821	39%
Tent	152	7%
Rec. Vehicle	241	11%
Camera	694	33%

Table 5.   Reasons for hunting upland birds.

	Very Important	Important	Not Very Important	Not at all Important
a. For the solitude	25	53	18	3
b. Test my hunting skills	10	44	38	7
c. Shoot a limit of birds	5	21	51	23
d. To be outdoors	69	29	2	-
e. For the meat	14	41	33	11
f. Be in a natural setting	46	45	7	2
g. Learn about upland birds	10	54	30	6
h. To work my hunting dog	16	16	12	56

Table 6.   Reasons for choosing a place to hunt and their importance.

	Very Important	Important	Not Very Important	Not at all Important
a. Good public access	39	31	19	11
b. Variety of upland birds	26	48	20	6
c. Lots of upland birds	42	47	11	1
d. Close to home	16	39	33	12
e. Facilities available	6	15	40	39
f. Commercial services	1	6	42	51
g. Hunt with family/friends	34	42	16	8
h. Familiarity with area	26	51	18	5
i. Few hunters	23	54	18	5

<u>Upland Game Bird Hunter Management Preferences</u>

Hunters were asked several questions related to upland game bird management and their perceptions regarding hunter numbers. Survey respondents were presented a list of factors that influence upland game bird populations. They were then asked to check whether they thought the reason was important in influencing populations. As Table 7 shows ninety eight percent felt that habitat influenced bird populations followed by predator numbers, bag limits, and hunting season length.

Bird hunters were also provided information about the effects of daily and possession limits on bird populations, Section IV, question 1. Given the information presented, hunters were asked if they preferred:

1. A daily bag limit that changes from year to year to reflect changes in bird populations

2. A stable bag limit accompanied by news releases telling you what to expect when you go hunting.

Both resident and nonresident bird hunter preferred a daily bag limit that changes from year to year, 57% and 55% respectively.

Hunters were also asked if the number of other hunters they saw while afield was what they expected to see and did these other hunters affect their hunting. Sampled hunters reported seeing an average of five other hunters and at least eighty five percent (85%) said that these other hunters did not affect their bird hunting.

Table 7.   Factors affecting upland bird populations.

	Very Important	Important	Not Very Important	Not at all Important
a. Habitat	83	15	1	1
b. Stocking programs	22	46	24	8
c. Predator numbers	42	43	12	3
d. Hunting season length	23	48	23	5
e. Daily/possession limit	26	53	16	5

MONTANA

No. 1032 — County Outline Map
STATE PUBLISHING COMPANY
Helena

Figure 1. Counties hunted by 55% of resident upland game bird hunters.

12

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No. 1032 — County Outline Map
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Figure 2. Counties hunted by 55% of nonresident upland game bird hunters.

13

CHAPTER IV

ECONOMIC EVALUATION

EXPENDITURE DATA

A measure of the economic significance of upland game bird hunting in Montana is hunter expenditures or actual out of pocket costs. Expenditures include transportation, food/beverage/lodging, equipment purchased just for this trip, and any guide or access fees. Both resident and nonresident costs are reported in Table 8.

Resident expenditures ($38.00 per day) are significantly lower than nonresident hunters' ($223.00) and are obviously related to distance traveled.

While expenditures are one measure of the economic significance of upland bird hunting they are **costs** to the hunters. Expenditure information is useful in showing the impacts of these dollars on income and employment in local communities.

Table 8. Upland Game Bird Hunter Trip and Expenditure Information.

	Complete Sample		Resident		Nonresident	
	Mean	Median	Mean	Median	Mean	Median
Miles	226.5	40	58	30	755	600
Driving Time	5	1	1.8	1	16	10
Hunters	1.5	1	1.5	1	1.5	1
Trip Costs: Transportation	86.5	20	25	15	284	200
Food, Drink, Lodging	68	10	22	7	208	130
Equipment for trip, access/guide fees, etc.	89	10	19	10	289	100
Total	243.50	40	66	32	781	430
Average number of days per trip (Mean)			1.75		3.5	
Average expenditures per day (Mean)			$37.71		$223.14	

14

Contingent Valuation Estimates

The upland game bird hunter survey asked hunters to provide information on several areas of either their "first" or "last" hunting trip. Two contingent valuation dichotomous choice questions were asked. The first question asked hunters to value their "first" or "last" trip and was worded:

> Suppose that everything about this "first" hunt was the same except your trip costs had been $xxxxx more, would you still have made the trip?

A simple yes or no is the only response a hunter can give, very much like the choice he would have in a real market situation. The dollar amount ($xxxx) was varied randomly across surveys and was one of ten predetermined amounts ranging from $5.00 to $1500.00.

In addition to the current trip question, a CVM question was asked that presented hunters with hypothetical changes in their trip. They were then asked to value this hypothetical situation. This question is presented below:

> Imagine that everything about your "first" trip was the same, except that you saw twice as many birds and your trip costs to visit this site increased by $xxxxx , would you still have made the trip?

This question provides insights into bird hunters willingness to pay for improved hunting opportunities. The bid levels presented hunters in this question were the same as for the current trip question.

Protest Responses and Outliers

There are two types of respondents that answer the contingent valuation questions that should be scrutinized. The first group is those hunters who said they would pay the stated bid amount but would not be able to given their income. Willingness to pay and the ability to pay are both necessary for economic demand analysis. Ability to pay was determined by first calculating the percentage of their income which respondents were willing to spend on upland game bird hunting. This was done in the following manner:

$$\text{Percent} = \frac{(\text{Expenditures} + \text{Bid Amount}) * \text{Trips}}{\text{Income}}$$

All respondents with a percent greater than 1 were excluded since this group obviously lacked the ability to pay.

The second group of respondents that should be excluded from the analysis are those who

"protested" in some way the hypothetical market. The Water Resources Council recommends asking a follow-up question to determine the reasons for "no" responses and decide which ones were protest bids. The upland game bird survey used the same format for this question as earlier surveys, which was:

"If no, would you have made the trip if your share of the expenses had been only $1.00 more?" Following a "no" to this question, the respondent was asked: "If no, could you briefly explain why not?"

Valid reasons for saying no included a) could not afford higher trip costs, b) hunter said he would hunt elsewhere if costs increased, c) trip just wouldn't be worth the higher costs. Protest responses included a) hunter saying he/she did not understand the question or b) indicated they opposed increased fees or taxes.

A total of twenty eight responses were excluded from the data set due to being protest bids or outliers.

Model Specification

The estimates of net economic value for an upland game bird hunting trip were determined from the sampled hunters' responses to the contingent valuation questions. The responses were analyzed using a logistic regression model. Duffield and Patterson (1991) provide a comprehensive discussion of the theory and techniques concerning these models.

Economic theory suggests that certain variables will influence a hunters response. A bivariate logit model was used in this study that regressed "yes" and "no" responses against bid amount. It is expected that as the bid amount increases, the probability of a "yes" response will drop. The following bivariate model was used in this study:

$$\ln (P/1-P) = B0 - B1 \ln(Bid)$$

where: P = probability of a "yes" response
           Bid = increased trip costs respondent was asked to pay

The estimated equations are shown in Appendix B. The coefficients for the independent variable ln(Bid) had the expected sign (negative) and were significant at the .05 level. These results show the responses are consistent with economic theory and the model used generally provided a good fit to the data.

<u>Benefit Estimates</u>

The measure of economic benefits (net economic value) used in this study is the truncated mean. The truncation point used is the maximum bid amount utilized - $2000.00 in this study. To estimate this value, the probability of a "yes" response is plotted against the various bid levels. Integrating the area under this curve provides an estimate of the mean. It should be noted that the truncated mean is a conservative estimate of mean willingness to pay since all those having a willingness to pay greater than the truncation point are included at this point.

Table 9 presents the current and improved trip values as well as the estimated values for two subsamples (residency and first/last trip) where it was thought that differences might occur. The trip value for nonresidents ($626.00) was significantly higher than residents ($236.00). After adjusting these values for the difference in trip length for these two groups, nonresidents' values were still higher than residents, $173.00 to $130.00. While there was a difference between first and last hunt values for the current trip they were not notable, especially when comparing the per day values.

The comparison of resident/nonresident values across current and improved condition trips showed no difference for resident hunters. Interestingly, nonresidents benefit estimates were less for the improved condition trip that for the current trip. It would seem they felt the current trip was good and there was no room for improvement.

The net economic values associated with the improved condition situation for "first" and "last" trips were also lower than the "first" and "last" trip values under current conditions. It would seem upland game bird hunters are satisfied with the numbers of birds they saw on their hunting trips and are not willing to pay more to see more birds than they actually did.

17

Table 9. Upland Game Bird Hunting - Net Economic Values Per Trip and Per Day for Current and Improved Conditions.

| Model	Sample Size	Mean Value ($)	
		Per Trip	Per Day
Current Trip (Entire Sample)	2028	328.77	149.44
Resident Subsample	1534	235.62	130.90
Nonresident Subsample	494	625.69	173.80
"First trip"	1037	356.05	147.13
"Last trip"	991	299.45	155.96
Improved Conditions (Entire Sample)	2012	297.13	135.06
Resident	1525	228.37	126.87
Nonresident	487	498.73	138.54
"First trip"	1033	327.42	135.30
"Last trip"	979	263.26	137.11

18

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APPENDIX A

Upland Game Bird Hunter Survey

MONTANA
UPLAND BIRD SURVEY
1990
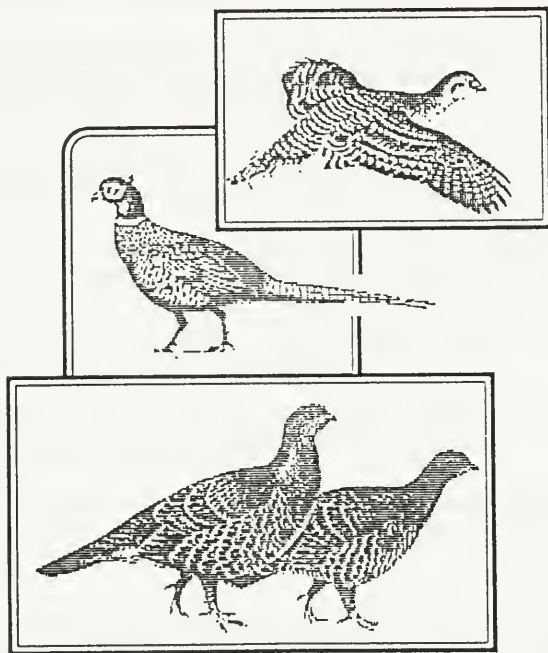
I. FIRST, WE HAVE SOME GENERAL QUESTIONS ABOUT YOUR UPLAND BIRD HUNTING (Sage Grouse, Partridge, Mountain Grouse, Sharp-tailed & Pheasant).

1. How many years have you been hunting upland birds? _____ Years

2. About how many days per year do you hunt upland birds? _____ Days

3. How many of these were spent upland bird hunting in Montana? _____ Days

4. How would you rate upland bird hunting compared to your other outdoor recreation activities? (please check one)

_____ It's my favorite outdoor recreation activity

_____ It's one of my favorite outdoor recreation activities

_____ It's just one of several outdoor recreation activities that I do

_____ I prefer other outdoor recreation activities

II. THE NEXT QUESTIONS ASK ABOUT YOUR "FIRST" AND "LAST" UPLAND BIRD HUNTING TRIPS IN MONTANA DURING THE 1989 SEASON

1. Dates of your "FIRST" trip: _____

   Dates of your "LAST" trip: _____

2. Use the map provided to determine which county you hunted in on your:

   "FIRST" trip: _____   "LAST" trip: _____

3. On your "FIRST" trip, how many days did you hunt? _____ Days

   On your "LAST" trip, how many days did you hunt? _____ Days

4. About how many hours per day did you hunt on your "FIRST" trip?

   _____ Hours

III. THE FOLLOWING QUESTIONS REFER TO YOUR "LAST" 1989 TRIP TO HUNT UPLAND BIRDS IN MONTANA:

5. On your "LAST" trip, were you hunting (check all that apply):

   Sage grouse _____ ? Partridge _____ ? Mountain grouse _____ ?

   Sharp-tailed _____ ? Pheasants _____ ?

6. Did you hire a hunting guide or outfitter?

   _____ Yes   _____ No

7. Was upland bird hunting the main purpose of your trip when you hunted in this area or did you make the trip for other reasons such as business or a family vacation? (please check one)

   _____ Hunting was the main purpose of this trip

   _____ Hunting was one of several reasons for making the trip

8. Which of the following items did you use while hunting upland birds in this area? (please check all items you used)

   _____ Binoculars   _____ Tent

   _____ Boat   _____ Trailer or R.V.

   _____ Retriever/pointer _____ Camera

9. About how many other upland bird hunters (not in your party) did you see while you were hunting this area on this trip?

   _____ Other hunters

10. Was this number of hunters : (please check one)

    _____ More than I expected to see

    _____ About as many as I expected to see

    _____ Fewer than I expected to see

    _____ I didn't have any expectations

11. Did the other upland bird hunters present affect your enjoyment of the hunting in this area?

_____ Yes _____ No

12. Was this the first time you hunted upland birds in this particular area?

_____ Yes _____ No, I've hunted here before

If no, how many years have you been hunting upland birds in this area?

_____ Years

13. How many separate trips did you make from your home to this hunting area this season?

_____ Separate trips from home this year

14. What are the most important factors you consider when deciding where to go upland bird hunting? (please check the box that best reflects the importance of each item)

	Very Important	Important	Not Important	Not at all important
a. Good public access	☐	☐	☐	☐
b. Variety of upland bird game species	☐	☐	☐	☐
c. High numbers of upland birds	☐	☐	☐	☐
d. Close to home	☐	☐	☐	☐
e. Availability of facilities	☐	☐	☐	☐
f. Proximity to commercial services	☐	☐	☐	☐
g. To hunt with family or friends	☐	☐	☐	☐
h. Familiarity with the area	☐	☐	☐	☐
i. Low numbers of bird hunters	☐	☐	☐	☐

15. People hunt upland birds for many reasons. We'd like to know some of the reasons you hunt to help us understand different types of hunters and their preferences.

Following is a list of possible reasons for upland bird hunting. Please check the box that says whether that reason was very important, important, not important, or not at all important.

	Very Important	Important	Not Important	Not at all important
a. For the solitude	☐	☐	☐	☐
b. To test my hunting skills	☐	☐	☐	☐
c. To shoot a limit of upland birds	☐	☐	☐	☐
d. To be outdoors	☐	☐	☐	☐
e. For the meat	☐	☐	☐	☐
f. To be in a natural setting	☐	☐	☐	☐
g. To learn more about upland birds	☐	☐	☐	☐
h. To work my hunting dog	☐	☐	☐	☐

16. Could you please look back over this list and circle the letters of the three most important reasons you hunted upland birds on this trip?

17. There are a number of factors that influence upland game bird populations. Please check the box that says whether that factor is very important, important, not important, or not at all important.

	Very Important	Important	Not Important	Not at all important
a. Habitat	☐	☐	☐	☐
b. Stocking programs	☐	☐	☐	☐
c. Predator numbers	☐	☐	☐	☐
d. Hunting season length	☐	☐	☐	☐
e. Daily bag and/or possession limits	☐	☐	☐	☐

WE REALIZE YOU AREN'T USED TO CONSIDERING UPLAND BIRD HUNTING THIS WAY, BUT PLEASE THINK ABOUT IT AND GIVE US YOUR BEST ESTIMATE!

1. About how far is it from your home to where you usually hunt?

___ Miles (one-way)

2. How long did it take to travel from your home to this area?

___ Hours (include any stops made en route)

3. If you drove, how many other hunters were in the vehicle?

___ Number of other hunters

4. About how much did you personally spend on your "LAST" hunting trip? If you can't recall the exact amount, please give your best estimate for each of the following three types of expenses.

___ Amount I spent for transportation (gas, car rental, airfare and any other transportation costs)

___ Amount I spent on food, beverages, and lodging

___ Amount I spent on equipment purchased just for this trip, access or guide fees, and all other expenses

___ TOTAL AMOUNT SPENT ON YOUR "LAST" HUNTING TRIP

5. Suppose that everything about this "LAST" hunt was the same except your trip costs had been $_____ more, would you still have made the trip?

___ Yes, I would still have made the trip.

___ No. If no, would you have made the trip if your share of the expenses had been $1.00 more?

___ Yes

___ No. If no, could you briefly explain why not:

6. Imagine that everything about your "LAST" trip was the same, except that you saw twice as many birds AND your trip costs to visit this site increased by $_____, would you still have made the trip?

___ Yes, I would still have made the trip.

___ No. If no, would you have made the trip if your share of the expenses had been $1.00 more?

___ Yes

___ No. If no, could you briefly explain why not:

IV. THE NEXT FEW QUESTIONS ASK YOUR OPINION ON DIFFERENT UPLAND BIRD HUNTING MANAGEMENT OPTIONS.

1. Research has determined that daily and possession bag limits do not adversely affect bird populations. Daily bag limits for grouse have varied from 3 - 5 birds as grouse populations have increased or decreased, while daily bag limits for partridge have generally remained stable despite population fluctuations. Given these facts, would you prefer:

___ A daily bag limit that changes from year to year to reflect changes in bird populations

___ A stable bag limit accompanied by news releases telling you what to expect when you go hunting

V. THESE LAST FEW QUESTIONS WILL HELP US UNDERSTAND YOUR RESPONSES BY KNOWING SOME BASIC INFORMATION ABOUT YOU:

1. Where are you from? City: _____ State : _____

2. What is your age? _____ Years

3. Are you: _____ Male _____ Female

4. Are you a member of any hunting, conservation, or sport organizations?

___ Yes ___ No

4a. If so, which one(s)? _____

5. What is the highest year of formal education you completed?

___ Some grade school ___ Some college

___ Finished grade school ___ Finished college

___ Finished junior high school ___ Some postgraduate work

___ Finished high school ___ Finished postgraduate

6. If you had not gone hunting this trip, would you have been working
   ___ Yes   ___ No

7. During the hunting season this year, were you ? (check one)
   ___ Employed full time   ___ Retired
   ___ Employed part time   ___ Homemaker
   ___ Unemployed   Other : ___

8. Please check your household's income before taxes last year :
   ___ Under 5,000   ___ 20,000 - 24,999   ___ 40,000 - 49,000
   ___ 5,000 - 9,999   ___ 25,000 - 29,999   ___ 50,000 - 74,999
   ___ 10,000 - 14,999   ___ 30,000 - 34,999   ___ 75,000 - 100,000
   ___ 15,000 - 19,999   ___ 35,000 - 39,999   ___ over 100,000

THANK YOU for your help. This information will be held in strict confidence and will be used for management purposes only. Is there anything else you'd like to tell us about hunting in this area? We would appreciate any comments:

If you would like to receive a copy of the survey results, please write "Results requested" and your address on the back of the return envelope (not on the questionnaire).

Estimated Bivariate Logistic Contingent Valuation Equations

Model	Statistics		Likelihood Ratio-Goodness of Fit Test		
	Intercept	Log (Bid)	Degrees of Freedom	Chi Square	P Value
Current Trip:					
Current Trip (Entire Sample)	3.50 (17.86)	-.7750 (-21.12)	8	18	.0206
Resident	3.37 (15.36)	-.8325 (-19.27)	8	20.6	.0082
Nonresident	4.84 (9.31)	-.8178 (-9.12)	8	10.71	.2187
"First" trip	3.41 (12.34)	-.7406 (-14.46)	8	10.21	.2504
"Last" trip	3.61 (12.99)	-.8152 (-15.38)	8	13.68	.0904
Improved Conditions:					
Improved Conditions (Entire Sample)	3.35 (18.01)	-.7738 (-21.26)	8	17.88	.0222
Resident	3.01 (14.65)	-.7788 (-18.54)	8	18.74	.0163
Nonresident	6.37 (10.0)	-1.128 (-10.27)	8	10.18	.2529
"First" trip	3.76 (13.53)	-.8182 (-15.44)	8	18.41	.0184
"Last" trip	2.99 (11.77)	-.7418 (-14.63)	8	14.92	.0608