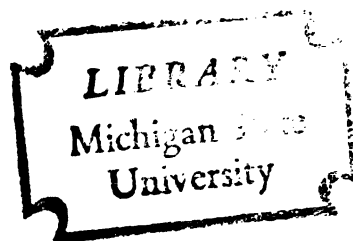




CERTAIN FACTORS AFFECTING THE ECONOMIC  
DEVELOPMENT OF WILDLIFE RESOURCES  
IN EAST CENTRAL MICHIGAN

Thesis for the Degree of M. S.  
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By

Jon Merle Parker

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# ABSTRACT

## CERTAIN FACTORS AFFECTING THE ECONOMIC DEVELOPMENT OF WILDLIFE RESOURCES IN EAST CENTRAL MICHIGAN

By

Jon Merle Parker

Several factors affecting the potential for the economic development of wildlife resources through fee hunting were evaluated. The factors studied were ownership and use of land, hunting activity and history, attitudes of landowners toward hunting and fee hunting, and legal considerations. The study area and its agricultural land use and ownership patterns were briefly described. Hunting activity was described using kill and hunter-days by major game species from 1956 to 1970. Responding to a multiple-choice questionnaire, 295 landowners described themselves socio-economically; and reported their attitudes toward hunters, hunting access, and fee hunting. Preferences for fee hunting programs and motivations for participation in managed hunting plans and wildlife were stated.

Variables significantly associated with fee hunting attitude were age of owner, participation in hunting, interest in hunting management, hunting access policy, and potential for hunting on the property. Landowners favored fee hunting programs providing control of hunter behavior and numbers with minimum government involvement. Median income desired was between \$3.01 and \$5.00 per acre per year.

Jon Merle Parker

One to four hunting parties per week were usually preferred.

Important considerations for managed hunting participation were trespass control, game law enforcement, and reduction of farmer-hunter problems. Important considerations for wildlife management were seeing more wildlife, better hunting, expense of management, and soil conservation benefits. A majority of landowners interested in fee hunting stated willingness to practice wildlife management. Competition of fee hunting with free hunting; laws affecting fee hunting; fee hunting education potential; and research, management, and institutional needs are discussed.

## ACKNOWLEDGMENTS

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## TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION . . . . .	1
STUDY AREA . . . . .	3
Location, Population, and Land Use . . . . .	3
Hunting Activity and Game Species . . . . .	3
METHODS . . . . .	8
Questionnaire . . . . .	8
Sampling Procedure . . . . .	8
Data Processing and Analysis . . . . .	10
RESULTS . . . . .	11
Questionnaire Returns . . . . .	11
General Characteristics of Respondents . . . . .	12
Attitudes of Respondents . . . . .	12
Non-respondents . . . . .	12
Hunters and hunting . . . . .	14
Fee hunting . . . . .	14
Fee Hunting Programs . . . . .	18
Important considerations . . . . .	18
Desired attributes . . . . .	21
DISCUSSION . . . . .	27
Potential Fee Hunting Cooperators . . . . .	27
Attitudes Toward Hunters . . . . .	28
Fee Hunting Concerns and Expectations . . . . .	28
Competition with Free Hunting . . . . .	31
Fee Hunting and the Law . . . . .	31
Potential Fee Hunting Education . . . . .	32
Research and Management Needs . . . . .	33
Institutional Needs . . . . .	34
CONCLUSION . . . . .	35



TABLE OF CONTENTS (Cont'd)

	<u>Page</u>
APPENDICES	
Appendix A. Hunting Attitude Questionnaire. . . . .	36
Appendix B. Questionnaire Cover Letter . . . . .	44
Appendix C. Reminder Postcard for Questionnaire . . . . .	45
LITERATURE CITED . . . . .	46

## LIST OF TABLES

<u>Number</u>		<u>Page</u>
1	Comparison of mean game kill and hunter-days for the years 1956-1960 and 1966-1970 in Huron, Sanilac, and Tuscola counties, Michigan.	6
2	Distribution of landholdings, 50 acres and larger, in Huron, Sanilac, and Tuscola counties, Michigan.	9
3	General characteristics and attitudes of respondents to the landowner attitude questionnaire.	13
4	Association of fee hunting attitudes with other characteristics of landowners.	17
5	Important considerations of landowners in deciding on participation in managed hunting programs and wildlife management.	19
6	Landowners' preferences for attributes of fee hunting programs.	22
7	Fees desired by landowners for hunting on their land.	24
8	Number of two to four person hunting parties desired per week for a specified fee.	24
9	Association of yearly income desired, hunting parties per week desired, and willingness to manage wildlife.	26
10	Estimated daily fee per hunter at various income and hunter participation levels.	30

## LIST OF FIGURES

<u>Number</u>		<u>Page</u>
1	Location of the study area showing game areas and townships closed to pheasant hunting.	4
2	Attitudes toward fee hunting categorized by property size.	15

## INTRODUCTION

Land in the United States is subject to competing demands for food production, urban development, and outdoor recreation. In this environment the landowner must seek maximum economic return from his property. Some of these competing demands are compatible, and, if properly integrated, will act to increase the total economic returns.

Eighty percent of the game harvested in this country is on private land (Teague, 1971). Under economic pressure landowners often are choosing to neglect or deliberately reduce potential wildlife resources, because they are viewed either as unprofitable or as a liability. With intelligent planning and management, wildlife on private property can be an aesthetic and economic asset to both producer and consumer.

Fee hunting is payment of the landowner for hunting privileges on his land. Such a system could affect the economic development of wildlife on private land, ease economic pressures on farm land, ease conflicts between sportsmen and landowners, and enhance the level of tourist-related enterprise. Limited information is available on landowner attitudes toward fee hunting in other states (Brown, 1974; Marshall, 1973, unpublished Master's thesis, Virginia Polytechnic Institute and State University, Blacksburg; and McIntosh, 1966, unpublished Ph.D. dissertation, University of Wisconsin, Madison).

These and other investigators have studied the hunting access problem in relation to posting of land and maintenance of free public hunting (Barclay, 1966, unpublished Master's thesis, Pennsylvania State University, University Park; Larson, 1958, unpublished Master's thesis, University of Massachusetts, Amherst). These authors found that attitudes and practices influencing hunting access were related to the following socio-economic and personal characteristics: property size, education, occupation, problems with hunters, hunting cooperative membership, hunting participation, total income, and income from the land.

This is a study of various factors affecting the potential for economic development of wildlife resources in Huron, Sanilac, and Tuscola counties -- Michigan's Thumb Area. General land use patterns, current status of wildlife populations and hunting activity, and the related legal aspects are surveyed; but the major area of study is the potential supply of land for fee hunting as revealed by attitudes, characteristics, and concerns of landowners. I attempt to identify the most desirable features of fee hunting programs and investigated the characteristics and motivations of potential cooperators to aid anyone interested in the development of a fee hunting program.

## STUDY AREA

### Location, Population, and Land Use

The Michigan counties of Huron, Sanilac, and Tuscola (Figure 1) comprised the study area. Ninety percent of the area's 120,000 people live in rural areas (U. S. Bureau of Census, 1972). Metropolitan areas border the three counties to the south and west.

The counties include 1.7 million acres of land, 80 percent of which is classified as agricultural (U. S. Bureau of Census, 1972). There are about 7500 farms averaging 166 acres in size (U. S. Bureau of Census, 1972). In 1969 the farmland was utilized as follows: harvested cropland, 62 percent; "other cropland" (i.e., soil improvement crops, cultivated summer fallow, crop failure, and idle cropland), 14 percent; pasture, 8 percent; woodlots, 8 percent; and "other farmland" (i.e., rangeland, ponds, roads, lots, barns, and houses), 8 percent. Important crops by acreage were dry beans, corn (grain and silage), wheat, hay, and small grains (U. S. Bureau of Census, 1972).

### Hunting Activity and Game Species

Data on hunting in the three counties were tabulated from Michigan Department of Natural Resources hunter survey results. The survey is mailed annually to a random sample of hunting license holders

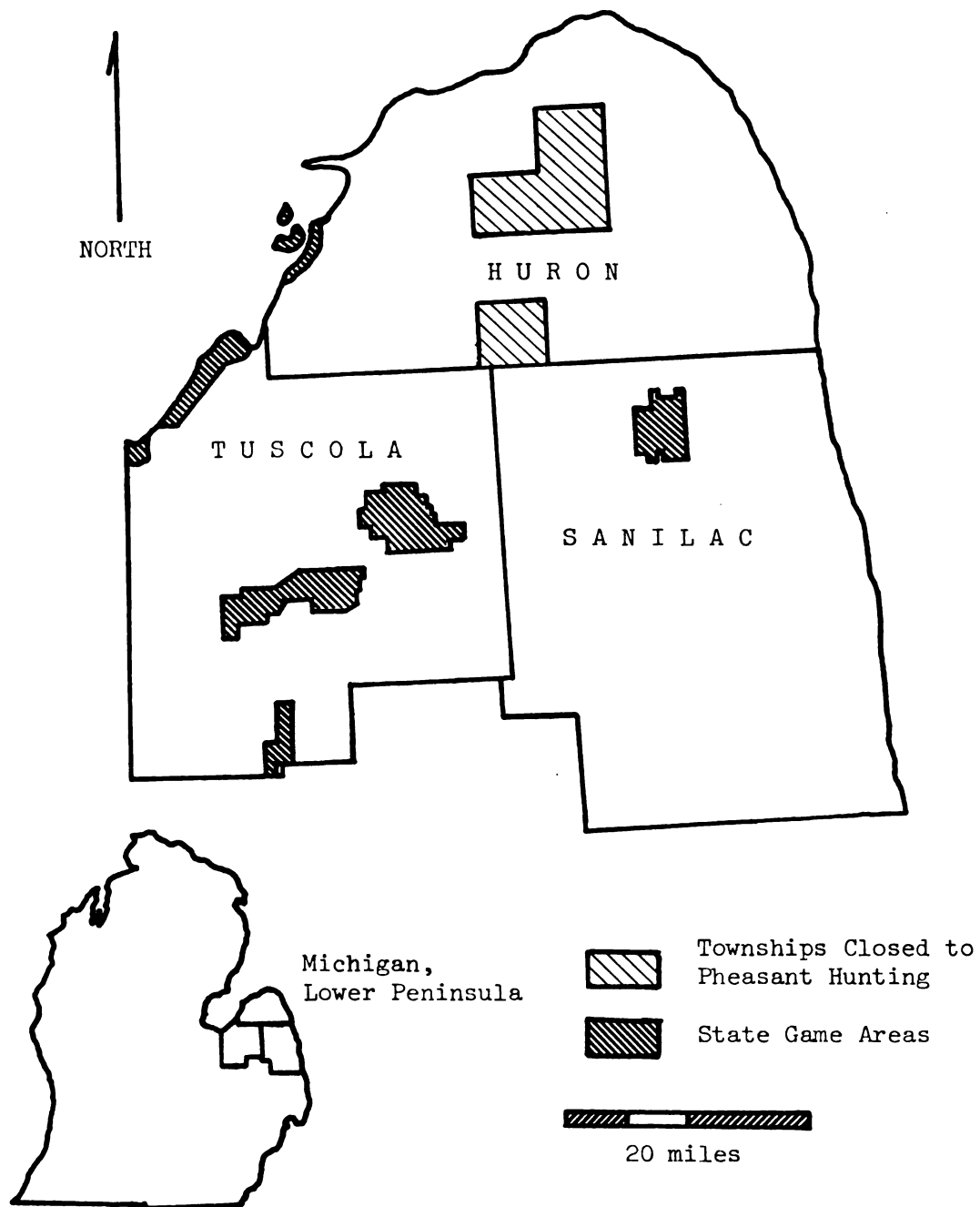


Figure 1. Location of the study area showing game areas and townships closed to pheasant hunting.

who are asked to report days hunted, numbers and species of game killed by county.

Waterfowl (*Anatidae*), ring-necked pheasant (*Phasianus colchicus*), cottontail rabbit (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), squirrel (*Sciurus* spp.), ruffed grouse (*Bonasa umbellus*), and woodcock (*Philohela minor*) provide most of the hunting recreation in the Thumb Area (Table 1). Between the periods 1956-1969 and 1966-1970 total hunter effort was essentially unchanged while total game harvest declined by 37 percent. Pheasant and rabbit harvests dropped by 83 percent and 51 percent, respectively, between the periods. Hunter effort for the two species also declined but not in proportion to the harvest (pheasant 61 percent, rabbit 31 percent). Deer, waterfowl, grouse, and woodcock harvest and hunter-days increased markedly between the periods. Although squirrel harvest increased, hunter-days remained about constant.

The decline of the pheasant is the most striking change between the 1956-1960 and 1966-1970 periods. The harvest decreased from over 55 percent of the Thumb Area total game harvest to about 16 percent. Hunter effort for pheasants declined from 55 percent of the total to 23 percent.

Four townships in Huron county have been closed to pheasant hunting since 1971 (Figure 1). The Michigan Department of Natural Resources is attempting to introduce the Korean strain ring-necked pheasant which wildlife biologists believe will be less dependent on agriculture and more cold hardy. The final release of Koreans was in 1973. Although final evaluation of the project has not been made, no dramatic increase in pheasant numbers has been observed (Zorb, 1972).



Table 1. Comparison of mean game kill and hunter-days for the years 1956-1960 and 1966-1970 in Huron, Sanilac, and Tuscola counties, Michigan (from Michigan Department of Natural Resources).

Game Species	Kill (x 1000)			Hunter-days (x 1000)		
	1956-60	1966-70	Percent change	1956-60	1966-70	Percent change
Pheasant	115	20	-83	211	83	-61
Rabbit	41	20	-51	89	61	-31
Ducks and Geese	31	61	97	38	110	189
Squirrel	13	16	23	27	28	4
Grouse and Woodcock	7	12	71	13	34	162
Deer <sup>a b</sup>	--	--	--	9	43	378
Totals	207	129	-37	387	359	-7

<sup>a</sup>Complete data available for 1958-60 and 1966-68 only.

<sup>b</sup>Average deer kill: 1956-60, 73; 1966-70, 537. Percent change: 636.

There are 39,000 acres of state-owned land, mostly State Game Areas, open to hunting in the area. Palmer (1967) estimated that 30 percent of hunter activity on state and private land in southern Michigan took place in the Thumb Area. He also reported a tendency of Detroit area hunters to utilize the Thumb counties more than other areas.

## METHODS

### Questionnaire

A seven-page, multiple-choice questionnaire was used in the landowner survey (Appendix A). Portions of the questionnaire were modifications of similar instruments by Barclay (1966, unpublished Master's thesis) and Marshall (1973, unpublished Master's thesis). Accompanying the questionnaire were a cover letter (Appendix B) and a postpaid, addressed return envelope. A postcard reminder (Appendix C) was sent to non-respondents two weeks after the initial mailing.

### Sampling Procedure

Subjects were chosen from farm card files at Agricultural Stabilization and Conservation Service (USDA) county offices. Owners of 50 acres or more were chosen systematically from the card files. I assumed that 50 acres was the absolute minimum size which could sustain an economic level of hunting pressure. The total sample represented numbers of property owners and property size classes in proportion to their occurrence in the three county area (Table 2).

A pilot survey was done prior to the three county survey to refine the questionnaire and estimate the proportion and quality of responses. The pilot study was sent to 77 property owners in

Table 2. Distribution of landholdings, 50 acres and larger, in  
Huron, Sanilac, and Tuscola counties, Michigan.

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Land Size (acres)	Number	Acres (1000)	Percent of Total Acres
50 - 139	2942	275	23
140 - 260	2277	428	35
261 - 499	1073	368	30
500 and over	210	142	12
Total	6502	1213	100

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Ingham county, located in south central Michigan in September, 1973. Two forms of the questionnaire, differing only in arrangement of questions, were used in the study.

The questionnaire was revised, and a single form was sent to 912 subjects in the Thumb Area in February, 1974. Distribution of the survey by county was: Huron - 256; Sanilac - 353; Tuscola - 303. The distribution was proportional to the number of farms in each county.

In April, 1974, with survey returns essentially complete, 35 randomly selected non-respondents were interviewed by telephone. Subjects were asked selected questions from the original questionnaire to test for bias. Telephone survey questions are identified by asterisks in Appendix A.

#### Data Processing and Analysis

Responses to the questionnaire were transferred to computer cards which were verified against the original responses. Analyses were performed using programs DATASET, PFCOUNT, ACT, and NUCROS from the Computer Institute for Social Science Research at Michigan State University. Frequency and percent of response were tabulated for each question. Responses to attitude question were sorted and tabulated by response to demographic, experiential, and land management variables. Association between variables was tested using the Chi-square tests for independence.

## RESULTS

### Questionnaire Returns

In the pilot study 35 usable questionnaires (45 percent) were returned. The three county study produced 295 usable returns (32 percent) which was a lower rate than the pilot study ( $\chi^2 = 5.49$ , 1 d.f.). Nineteen unusable returns from the final survey were classified as follows: questionnaires blank, written comments unfavorable to hunting, 12; questionnaires blank, no comment about hunting, 4; questionnaires completed, property size less than 50 acres, 3. Over 95 percent of total returns in both studies were received within 35 days of the first mailing. Returns by county in the Thumb Area study were: Huron, 86 (28 percent); Sanilac, 118 (33 percent); Tuscola, 91 (36 percent). There was no difference in return rate by county ( $\chi^2 = 3.56$ , 2 d.f.). Returns by property size class were: 1) 50 - 139 acres, 104 (25 percent); 2) 140 - 259 acres, 90 (28 percent); 3) 260 - 499 acres, 72 (48 percent); 4) 500 acres and larger, 18 (60 percent). Eleven questionnaires were unclassified by property size. Responses were progressively higher than calculated expected values for the last three size classes and lower than expected for the 50 - 139 acre size class ( $\chi^2 = 39.00$ , 3 d.f.).

## General Characteristics of Respondents

Most of the respondents did some farming on their land with cash field crops being the most important product (Table 3). Ninety percent lived on their farm property. Sixty percent of the respondents earned at least half of their income from their land. Median income fell in the \$10,000 - \$14,999 category. Unemployed and retired persons made up 21 percent of the sample; 79 percent were employed at least part-time. Median age fell in the 51 - 60 year group. Mean education was 11.3 years (calculated from the complete distribution). A majority of the respondents participated in hunting and fishing, but very few belonged to sportsman's clubs. Three-fourths of all respondents watched television shows related to hunting, fishing, or outdoors activities.

Data for several variables probably should be interpreted carefully because of errors in typing and imprecise wording of the questionnaire. For example, the income question does not include choices for \$24,001 to \$24,999, and some respondents may have reported income as gross farm sales. Also, some respondents may have equated "employment" with non-farm employment, and the "education" question did not offer a "zero" choice.

## Attitudes of Respondents

Non-respondents.--Chi-square tests for independence between respondent and non-respondent answers indicated no difference between the groups. Fee hunting attitudes and hunting access attitudes did not differ significantly between the groups ( $X^2 = 0.73$ , 2 d.f.; and 0.45, 1 d.f., respectively). Trends in responses were similar.

Table 3. General characteristics and attitudes of respondents to the landowner attitude questionnaire.

Variable	Occurrence		Variable	Occurrence	
	Number	Percent		Number	Percent
Land use			Age (years)		
Farmed by owner	203	71	18-30	12	4
Rented to others	56	20	31-40	49	17
Other (set-aside, personal pleasure, etc.)	14	5	41-50	75	27
Part farmed, part rented	12	4	51-60	86	31
			61 and over	60	21
Reside on property	211	90	Recreation activities		
Farm products			Watch television "outdoors"		
Cash field crops	130	48	shows	221	75
Crops and livestock	84	31	Hunting	176	65
Livestock	56	21	Fishing	157	53
			Read hunting and fishing magazines		
Income from land			Sportsman's club	141	48
All	119	44		36	12
Less than half	79	29	Hunting access policy		
None	27	10	Public usually	138	56
More than half	25	9	Public sometimes	55	22
About half	23	8	No hunting	28	11
			No restrictions	16	7
Income (dollars per year)			Friends and relatives	10	4
0-2,999	12	5			
3,000-5,999	33	13	Hunting control program -		
6,000-9,999	40	16	considered or participated	99	37
10,000-14,999	65	26			
15,000-24,000	47	19	Hunting potential exists on		
25,000 and over	49	20	land	144	55
Employment			Education (years)		
Full-time	193	72	1-8	64	23
Retired	47	18	9-12	167	60
Part-time	19	7	13 and over	46	17
Unemployed	8	3			



Hunters and hunting.--Respondents answered the question "What is your attitude toward hunters?" as follows: generally favorable, 198 (71 percent); generally unfavorable, 59 (21 percent); no opinion, 22 (8 percent). Most landowners allow some public hunting on their property, usually only if permission is asked first (Table 3). Only 11 percent of respondents allowed no hunting on their property. Thirty-seven percent of the respondents have either considered or participated in a program to control hunters on their land. "Experiences with hunters" reported were: trespassing, 152 (52 percent); courtesy, 136 (46 percent); discourtesy, 83 (28 percent); property damage, 79 (26 percent); firearm carelessness, 47 (16 percent); invited landowner to hunt, 47 (16 percent); "none", 27 (9 percent); shared game, 17 (6 percent); hunter assisted landowner, 13 (4 percent).

Fee hunting.--Responses to the fee attitude question were grouped into four composite response groups. The groups and percent response were: 1) "Opposed to fee hunting" (38 percent); 2) "Believe fee hunting not worthwhile" (24 percent); 3) "Interested in the potential of fee hunting" (19 percent); 4) "Interested in fee hunting at present" (19 percent). Category one includes those who "would never allow hunting on their land" or thought "fee hunting is wrong". Number two includes only those who stated that fee hunting was not worth the trouble. Group three expressed some interest in fee hunting, but did not think "fee hunting would be worth the trouble". Group four expressed interest in fee hunting without qualifications.

Interest in fee hunting increased with property size while opposition decreased (Figure 2). Owners of 260 acres and over had

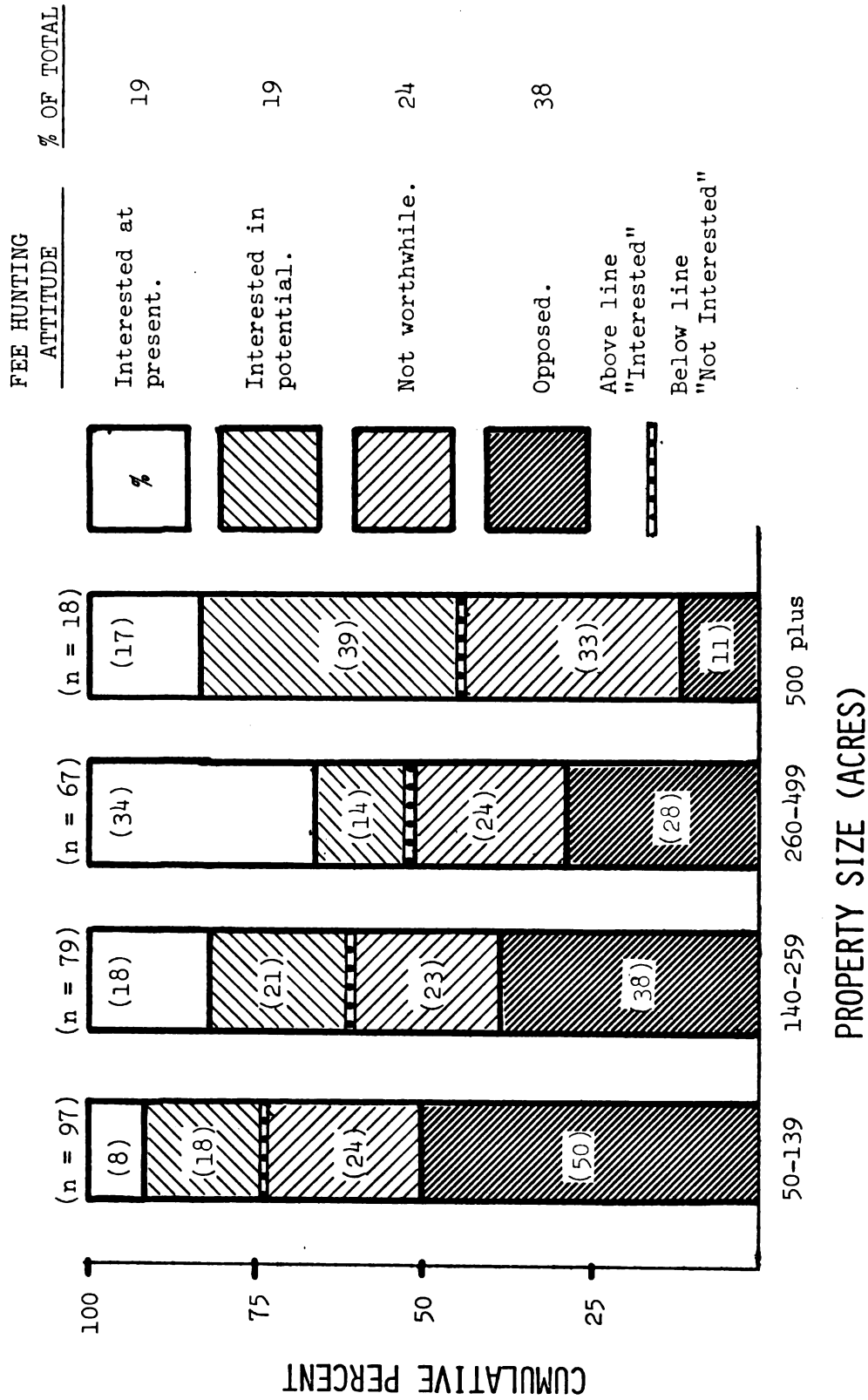


Figure 2. Attitudes toward fee hunting categorized by property size.

the greatest proportional interest in fee hunting. The largest property owners (500 acres and over) were more interested in "the potential of fee hunting" than "interested in fee hunting at present". The proportion of respondents who believed that "fee hunting is not worthwhile" was constant over property size classes.

Other variables that were significantly related to fee hunting attitudes were age, personal participation in hunting, an interest in controlling hunting on their land, willingness to let others hunt on their property, and belief in the hunting potential of their land (Table 4). Sixty-five percent of all respondents were hunters. Forty-two percent of those were interested in fee hunting compared to only 28 percent of non-hunters. Thirty-seven percent of the respondents reported participation in or consideration of activities to gain income from hunting or to formally control hunting on their land. Two-thirds of this group were interested in fee hunting.

Landowners were asked to state their policy for determining hunting access to their property. A significant association was found between attitudes toward allowing people to hunt on their property and attitudes toward fee hunting. Respondents allowing no hunting were not included since they all opposed fee hunting. Eighty-five percent of respondents allow at least some public hunting by permission, and seven percent allow unrestricted hunting (Table 3). Only 12 percent of the landowners in groups most and least restrictive of access were interested in fee hunting. Forty-seven percent of respondents who allow some public access by permission expressed interest in fee hunting.

Table 4. Association of fee hunting attitudes with other characteristics of landowners.

Characteristics Tested for Association with Fee Hunting Attitude	Results of Test		
	N <sup>a</sup>	$\chi^2$	d.f. <sup>b</sup>
Property size	261	29.58	9 **
Age	259	5.84	1 *
Participation in hunting	268	4.91	1 *
Interest in controlling hunting	268	58.55	3 **
Willingness to allow hunting	219	11.64	3 **
Land with hunting potential	264	41.88	3 **
Residence on the land	214	0.25	1
Land use	268	6.24	6
Farm products	245	3.71	6
Proportion of income from land	253	6.24	6
Employment	245	4.02	6
Education	257	4.62	6
Income	228	17.05	12

<sup>a</sup>Numbers vary because of non-response to one or both variables.

<sup>b</sup>Some categories were combined for analysis.

\*\*Statistically significant ( $P < 0.01$ )

\* Statistically significant ( $P < 0.05$ )

Fifty-five percent of respondents stated that a potential for hunting exists on their land. Fifty-four percent of those respondents were interested in fee hunting compared to 17 percent of those who felt that there was no potential on their land.

Property owners with hunting potential on their land were asked to list potential game species. Species reported with the percentage of landowners reporting were pheasant (83 percent), rabbit (76 percent), deer (63 percent), squirrel (49 percent), and waterfowl (17 percent).

Characteristics found unrelated to fee-hunting attitudes were residence on the land, land use, farm products, proportion of income from land, employment, education, and income (Table 4).

#### Fee Hunting Programs

Important considerations.--Respondents were asked to indicate which potential results of fee hunting would influence their decision to participate in hunting programs or in wildlife management (Table 5). Responses were analyzed for all respondents except those who were opposed to all hunting on their land. Enforcement of trespass and game laws, possible property damage, and reduction of farmer-hunter problems were most frequently reported as important. Effects on the community such as increased business opportunity, jobs for youth, influx of people into the county, and demands on local services seemed to be less important. Income from hunters and inconvenience caused by hunters asking for permission were cited by 46 percent of the respondents.

Table 5. Important considerations of landowners in deciding on participation in managed hunting programs and wildlife management.

Important Consideration	Favorable Responses	
	Number	Percent <sup>a</sup>
<u>Managed Hunting Program</u>		
Trespass control	198	93
Property damage	174	86
Game law enforcement	170	86
Reduction of hunter problems	143	78
Business opportunities <sup>b *</sup>	117	67
Inconvenience: more people <sup>b *</sup>	120	63
Jobs for youth	104	59
Demands on local services	102	56
Inconvenience: more hunters <sup>b **</sup>	92	49
Income from hunters <sup>b ***</sup>	83	46
<u>Wildlife Management</u>		
Seeing more wildlife	189	91
Better hunting	163	82
Expense	148	82
Soil conservation	145	80
More hunters	108	61
Income from hunters <sup>b *</sup>	83	46
Lower crop production <sup>b ***</sup>	83	45

<sup>a</sup>Based on total number of responses to each question.

<sup>b</sup>Significantly associated with fee hunting attitude.

\* P < 0.05

\*\* P < 0.01

\*\*\* P < 0.005

The considerations above were analyzed in relation to fee hunting attitude categories. Significant associations were found between fee hunting attitudes and the following variables: personal inconvenience caused by more people in the county ( $\chi^2 = 7.64$ , 2 d.f.), and by more hunters ( $\chi^2 = 10.28$ , 2 d.f.) was related to a negative fee hunting attitude; while increased business opportunity ( $\chi^2 = 6.62$ , 2 d.f.), and income from hunters ( $\chi^2 = 64.02$ , 2 d.f.) were related to a positive attitude.

Income was a more important consideration to respondents interested in fee hunting (76 percent) than to those not interested (19 percent). A similar, but less marked, trend was observed for expectations of business opportunities. Respondents who were interested in fee hunting without qualifications were less concerned with personal inconvenience (36 percent) than those expressing qualified interest in fee hunting (63 percent). Respondents not interested in fee hunting cited personal inconvenience 58 percent of the time.

The prospect of seeing more wildlife on the land was the most frequently cited reason for considering wildlife management (91 percent). Better hunting, time and money spent, and soil conservation benefits were also important considerations.

Potential income from hunters and lower crop production were the least cited considerations, but both were significantly associated with fee hunting attitude ( $\chi^2 = 6.79$ , 2 d.f., and  $\chi^2 = 61.39$ , 2 d.f., respectively). Crop production losses were most important to respondents who were interested in the potential of fee hunting (59 percent) and least important to those opposed to fee hunting

(33 percent). Forty-four percent of respondents who were presently interested in fee hunting were concerned about lowered crop production.

Desired attributes.--The attributes of fee hunting programs were evaluated by analyzing the responses of those not opposed to fee hunting (Table 6). Answers to individual statements were tabulated separately, so percentages pertain only to those who answered each question. Respondents heavily favored any means of controlling hunter access. Conspicuous hunter identification devices, specific parking areas, limitation of hunter numbers, and the exclusion of misbehaving hunters were approved by an average 94 percent. Reservations for hunters, increased numbers of conservation officers, and the prohibition of racial discrimination averaged 78 percent approval.

Property owners generally favored setting hunting fees themselves. Sixty-seven percent of respondents approved of each landowner setting his own fees. Eighty-three percent approved of maximum and minimum fees set by cooperating landowners. Only 17 percent of respondents approved of government-set maximum and minimum fees.

Most respondents (73 percent) favored collecting their own fees. Thirty-seven percent approved of government leasing of public hunting rights from landowners. Thirty-six percent approved of landowners leasing hunting rights to sportsmen directly. Twenty-three percent approved of government collection and distribution of hunting fees. Twenty percent approved of using a cooperative agent to collect and distribute fees.



Table 6. Landowners' preferences for attributes of fee hunting programs.

Program Attribute	Favorable Responses	
	Number	Percent <sup>a</sup>
Undesirables excluded	139	98
Hunter numbers limited	141	98
Controlled parking	127	93
Hunter identification	124	89
Owner cooperative sets fees	109	83
More conservation officers	110	80
No racial discrimination	108	78
Reservations required	102	77
Operation by landowner	102	77
Owner collects fees	93	73
Each owner sets fees	84	67
Government leases hunting	47	37
Owner leases to sportsmen	46	36
Operation by government	31	24
Government collects fees	30	23
Owners' agent collects fees	25	20
Government sets fees	21	17

<sup>a</sup>Based on total responses to each question.

Liability for hunters' injuries was an important consideration for 93 percent of respondents. The most popular alternatives for liability relief were a state law waiving landowner liability for hunters (78 percent approval) or a hunter waiver of liability (58 percent approval). Hunter payment for insurance and owner financed insurance received only 10 and 7 percent approval, respectively.

Respondents were asked to indicate yearly income desired per acre for fee hunting. Median income desired was in the 3.01 - 5.00 dollar range (Table 7). Forty-four percent of respondents desired three dollars or less per acre per year. Fee desired was found to be independent of fee hunting attitude ( $\chi^2 = 4.51$ , 4 d.f.). Thirteen percent of those stating opposition to fee hunting indicated a desired income, usually in the \$0.10 to \$1.00 range.

Sixty-three percent of the respondents wanted only one to four hunting parties per week with two to four hunters in each party (Table 8). Most of the remaining respondents would accept five to ten hunting parties per week, given the desired fee. Number of hunters desired was found to be independent of fee hunting attitude ( $\chi^2 = 2.00$ , 4 d.f.).

Two-thirds of responding landowners (n = 136) indicated that they would ". . . be willing to spend some time each year to provide food and cover for wildlife . . .", given their desired income. Responses to this question were found to be associated with fee hunting attitudes ( $\chi^2 = 20.55$ , 2 d.f.). Eight of ten respondents expressing some interest in fee hunting stated willingness to manage wildlife, while only 38 percent of those who believed fee hunting was not worthwhile stated such willingness.

Table 7. Fees desired by landowners for hunting on their land.

Yearly Income (dollars per acre)	Number	Percent
0.10 - 1.00	29	24
1.01 - 3.00	25	20
3.01 - 5.00	33	27
5.01 - 7.00	11	9
7.01 - 9.00	5	4
Over 9.00	20	16

Table 8. Number of two to four person hunting parties desired per week for a specified fee.

Hunting Parties Per Week	Number	Percent
1 - 4	82	63
5 - 10	34	26
11 - 15	5	4
16 - 20	3	2
Any number	6	5

Total income desired by landowners for fee hunting was estimated by multiplication of median fee desired per acre by median property size in each category. The resultant estimates were categorized as "Low" (less than \$500 per year), "Medium" (\$500 to \$2000 per year) and "High" (over \$2000 per year) (Table 9).

In a three-way contingency-table analysis, a significant association was found among estimated total income, number of hunting parties, and willingness to manage wildlife (Table 9,  $\chi^2 = 17.14$ , 2 d.f.). Willingness to manage for wildlife and number of hunting parties desired generally increased with income desired. Total income desired was independent of fee hunting attitude ( $\chi^2 = 3.47$ , 2 d.f.).

Table 9. Association of yearly income desired, hunting parties per week desired, and willingness to manage wildlife.

Income Desired	<u>Management</u>		<u>No Management</u>	
	<u>Hunting Parties Per Week</u>			
	1-4	5 or more	1-4	5 or more
Low	21	5	14	7
Medium	20	20	10	1
High	8	12	3	2

## DISCUSSION

Answers to a questionnaire give only an indication of concerns of respondents on an abstract or intellectual level; the results do not allow prediction of actual economic decisions. However, such information may provide a baseline for approaching a relatively unexplored problem. Further, initial reactions of respondents and differences among respondent groups may be useful in designing initial attempts at educational or organizational efforts in the behalf of fee hunting programs.

### Potential Fee Hunting Cooperators

Several characteristics were identified from questionnaire responses which tend to be associated with interest in fee hunting. Potential fee hunting cooperators are most likely to be less than 50 years old and to own over 260 acres of land which they believe has hunting potential. This group tends to be more interested in hunting than the general population of Thumb Area landowners. Owners interested in fee hunting are more likely to be hunters themselves and to allow strangers to hunt when permission is asked. They probably also have considered or participated in specific hunting control activities. It does not appear that interested landowners differ significantly from non-interested landowners in other general characteristics measured.

### Attitudes Toward Hunters

Hunters as a group appear to enjoy a good reputation among Thumb Area property owners. General attitude toward hunters was favorable, and a sizeable percentage of landowners allow strangers to hunt on their land provided they request permission. This outlook is surprising when coupled with widespread reporting of trespassing, property damage, and discourtesy. Access to private land seems to be less a problem in this area than is reported in others (e.g., Brown, 1974).

### Fee Hunting Concerns and Expectations

Control of hunter behavior and numbers seemed to be the foremost expectation of a fee hunting program. Individual or cooperative fee hunting program management was preferred by a majority of potential cooperators. However, a significant minority approved of some government involvement.

Direct, personal consequences of fee hunting programs such as trespass control and potential property damage concerned owners more than community benefits such as jobs for youth and demands on local services. As one might expect, those who were most interested in fee hunting were more interested in business opportunities and potential income and less concerned with personal inconvenience than were the less interested landowners.

An increase in small game populations is vital to the success of fee hunting in the Thumb Area (Table 2). The apparent willingness of landowners to manage for wildlife is therefore a most favorable

indication for the future. The fact that potential cooperators felt that there was hunting potential, especially for pheasants, on their land also enhances fee hunting opportunities.

Personal considerations, including economic ones, were shown to be most important in wildlife management decisions. Expense of management and prospects of seeing more wildlife were the most frequently reported concerns. Income was more important to landowners most interested in fee hunting. Fear of lost crop production was the least stated concern. However, property owners most interested in fee hunting were also most concerned about potential crop losses. This may reflect both the preponderance of larger, more intensive farming operations in this group and a realistic cost analysis of fee hunting.

An estimate of necessary daily hunter fees based on responses to questions on income and number of hunters desired was made (Table 10). Estimated mean yearly income was derived from estimated total yearly income shown in Table 7. The potential daily fees range from just over one dollar to sixty-five dollars. Data are needed to relate hunter expectations of daily fees in order to evaluate the potential market. The effective four-week hunting season allows for a three-week pheasant season plus one-week's additional hunting during seasons for other small game and deer. Increased income expectations with increasing costs in wildlife management and numbers of hunters accommodated (Table 9) may indicate that landowners are indeed capable of placing wildlife in an economic perspective.



Table 10. Estimated daily fee per hunter at various income and hunter participation levels.<sup>a</sup>

Estimated Mean Yearly Income <sup>b</sup>	<u>Number of Hunting Parties Per Week</u>		
	4	10	15
Low (\$230)	\$ 4.80	\$ 1.92	\$ 1.28
Medium (\$872)	\$18.16	\$ 7.27	\$ 4.85
High (\$3133)	\$65.00	\$26.11	\$17.50

<sup>a</sup>Based on four weeks of hunting per year and three hunters per party.

<sup>b</sup>Respondents were grouped after multiplying (income expected per acre per year) X (acres owned).

### Competition From Free Hunting

Eighty-five percent of respondents reportedly allow at least limited public hunting, and 74 percent of those respondents usually or always allow strangers to hunt. Although analysis of fee hunting attitudes in relation to hunting access attitudes revealed that 54 percent of those not interested in fee hunting allowed some public access, significantly more owners interested in fee hunting reported hunting potential on their land than did owners not interested in fee hunting. Willingness to manage for wildlife and desire to control hunter numbers should enhance the quality of the hunting experiences on fee hunting cooperators' properties.

### Fee Hunting and the Law

Several state and local laws may hinder the development of fee hunting. First, game animals are considered property of the state, and it is ". . . unlawful for any person, directly or indirectly, to buy, sell, expose, or offer for sale any game animal or game bird . . ." (Michigan Department of Natural Resources, 1972: 142). Care should be exercised in the organization of fee hunting to avoid conflict with this law.

Under present law a hunter participating in fee hunting would become a legal invitee of the property owner. The owner owes an invitee the highest legal degree of "ordinary and reasonable care" to protect harm from befalling him, including regular repairs and inspections of the premises (Michigan Natural Resources Council, 1974). The degree of potential liability mandates insurance protection or

some form of relief for fee hunting cooperators. Respondents naturally preferred "painless" legislative relief from liability. Respondents also favored a hunter waiver of liability, but this action does not always guarantee protection (Michigan Natural Resources Council, 1974).

The laws most detrimental to fee hunting in the study area are the Thumb Area counties' Sunday hunting bans (Michigan Department of Natural Resources, 1972:278,284,285). The Huron and Sanilac county laws prohibit all Sunday hunting. Tuscola county prohibits Sunday hunting ". . . on lands or premises of another . . .", thus allowing hunting on one's own land or on state-owned land.

#### Potential Fee Hunting Education

The respondents' awareness about fee hunting appeared to be low. This was indicated by the small percentage who reported that they had participated or considered specific hunting access control practices (Table 3). Only 11 percent of respondents said they had ever considered charging individuals to hunt. The most commonly considered or practiced activity was membership in a landowner cooperative to control hunter access. Six percent had participated in such a cooperative, and 15 percent had considered it. To implement a fee hunting program it would be necessary, therefore, to raise awareness of fee hunting and then to interest them in the concept.

Responses to the questionnaire indicate that property owners may be successfully introduced to the idea of fee hunting through television outdoor recreation programs. Control of hunters and non-monetary benefits should be stressed, but potential income

should definitely be mentioned. Further, in-depth, information could be made available through educational programs sponsored by the Cooperative Extension Service and through magazine articles.

#### Research and Management Needs

The potential sportsman demand for fee hunting should be examined. How much, if anything, will the average hunter pay for hunter privileges. The question of "quality" of the hunting experience desired in terms of optimum hunter density and availability of game should also be addressed. Possibly the ease of access to fee hunting properties, in itself, would be a major incentive to sportsmen.

The only real test of the feasibility of fee hunting would be in its actual implementation, perhaps on a limited, demonstration basis. From the skepticism expressed in this questionnaire, wide acceptance of fee hunting by landowners would only follow proof of the practicality and economic viability of the concept. In conjunction with a demonstration of fee hunting, there is a need for the development of game management plans for cooperators. The goal of the management plans should be to maintain or increase total farm income through crop production benefits of certain management practices and through the economic utilization of wildlife resources. Respondents to the questionnaire have demonstrated that they can view wildlife in economic as well as aesthetic terms.

## Institutional Needs

Cooperation of the Michigan Department of Natural Resources (MDNR) should be sought. The MDNR has discouraged fees for hunting in their Williamston Plan for cooperative hunting access control (Michigan Department of Natural Resources, 1969). Under Williamston Plan agreements, the MDNR provides assistance (management plans, signs for posting land, and cooperation in law enforcement) to cooperatives meeting specific organizational criteria. Perhaps this plan could be re-evaluated for the inclusion of the fee hunting concept.

Sunday hunting bans in the Thumb Area should be re-evaluated for the possible exception of fee hunting cooperators from the law's provisions. This would further enhance the competitive position of fee hunting enterprises relative to "free" hunting properties. Also, if fee hunting gains wide acceptance, area citizens might consider advocacy of the institution of a hunting season for mourning doves (*Zenaidura macroura*) in Michigan. This highly popular game bird would effectively extend the hunting season and increase the economic feasibility of fee hunting in the Thumb Area.

## CONCLUSION

This survey reveals a potential for a fee hunting system in the Thumb Area. The opportunities and problems revealed present a challenge for interested groups or individual citizens. Cooperation among landowners' and sportsmen's organizations, state and local governmental units, state and federal agricultural and natural resources agencies, and local, state, and federal economic development groups would facilitate orderly development of fee hunting. This multi-institutional approach would be most effective in resolving conflicts among various interest groups and in implementing a fee hunting program across political jurisdictions.

I must stress that an interested, energetic group must actively pursue the potential presented here. The problems presented are not insurmountable, and the benefits could enhance the economic situation and the aesthetic quality of life in the Thumb Area.

## APPENDICES

## APPENDIX A

### Hunting Attitude Questionnaire



APPENDIX A

HUNTING ATTITUDE QUESTIONNAIRE  
DEPARTMENT OF FISHERIES AND WILDLIFE  
MICHIGAN STATE UNIVERSITY

SECTION I

This section will describe some of your interests and experiences which may relate to your attitudes toward hunting on your property. (Please check the appropriate answer or answers for each of the following questions).

1. What experiences have you had with hunters on your land?
  - a. ☐ None
  - b. ☐ Assisted you in some way
  - c. ☐ Trespassing
  - d. ☐ Courteous to you
  - e. ☐ Discourteous to you
  - f. ☐ Shared his game with you
  - g. ☐ Invited you to hunt with him
  - h. ☐ Carelessness with firearms
  - i. ☐ Damage to your property or livestock
  - j. ☐ Other (Please describe briefly)

---
- \* 2. What is your attitude toward hunters?
  - a. ☐ Generally Favorable
  - b. ☐ No Opinion
  - c. ☐ Generally Unfavorable
3. Have you ever participated in or seriously considered any of the following activities?

	<u>Participated</u>	<u>Considered</u>
a. Renting or leasing your land for hunting	<input type="checkbox"/>	<input type="checkbox"/>
b. Charging individuals to hunt on your land	<input type="checkbox"/>	<input type="checkbox"/>
c. Enrolling any of your land in the Cropland Adjustment Program (CAP) with agreement for public hunting	<input type="checkbox"/>	<input type="checkbox"/>
d. Forming a landowners' cooperative hunting organization (to control hunter access)	<input type="checkbox"/>	<input type="checkbox"/>
- \* 4. Please indicate which of the following activities you participate in.
  - \* a. ☐ Hunting
  - \* b. ☐ Fishing
  - c. ☐ Sportsmen's club
  - \* d. ☐ Reading hunting and fishing magazines
  - \* e. ☐ Watching television programs devoted to hunting, fishing, and other outdoor activities

- f. \_\_\_\_\_ Other outdoor recreation (hiking, camping, etc.) (Please describe briefly) \_\_\_\_\_

## SECTION II

In this section, you have the opportunity to express some of your views about hunting on your property. In question 5, check the appropriate answers.

- \* 5. Do you believe that there is a potential for hunting on your land?

- \* a.          Yes                      b.          No

- c. If Yes, for which kinds of game animals?      Rabbits  
     Pheasants      Squirrels      Waterfowl      Deer  
     Other (Please Specify)

In questions 6, 7, and 8, read each statement and circle either "A" (Agree) if you generally agree with the statement or "D" (Disagree) if you generally disagree with the statement.

- |  | <u>Agree</u> | <u>Disagree</u> |
|--|--------------|-----------------|
| * 6. I am strongly against hunting in general;<br>I will never allow hunting on my land. | A            | D               |

(If you agree with this statement, do not complete the rest of this section. Please go to Section V and continue from there).

- \* 7. Some landowners have made the following statements about hunting on their land. How do you feel about the statements?

- |   | <u>Agree</u> | <u>Disagree</u> |
|---|--------------|-----------------|
| a. I do not allow hunting on my land.   | A            | D               |
| b. I only allow my relatives and close friends to hunt on my land.                  | A            | D               |
| c. I sometimes allow strangers to hunt on my land, if they ask my permission first. | A            | D               |
| d. I usually allow strangers to hunt on my land, if they ask my permission first.   | A            | D               |
| e. Anyone may hunt on my land, with or without my permission.                       | A            | D               |

- \* 8. Below are some landowners' statements about fee hunting. Fee Hunting is a system which would enable you to earn additional income by charging hunters to hunt on your land. How do you fee about the following statements?

- See about the following statements?
- |  | <u>Agree</u> | <u>Disagree</u> |
|--|--------------|-----------------|
| a. I think it is wrong to earn income from fees for hunting on my land. (If you agree, do not complete this section, as the questions immediately following do not apply to you. Please go directly to Section IV and continue). | A            | D               |

	<u>Agree</u>	<u>Disagree</u>
b. I don't think the income from fee hunting would be worth the trouble involved.	A	D
c. If I were convinced that fee hunting would be profitable and convenient, I would consider trying it on my land.	A	D
d. I would try any fee hunting plan that seemed reasonable. It is about time that I received a fair income from hunters using my land.	A	D

## SECTION III

The following questions will give you an opportunity to indicate some of the features you think should be included in a fee hunting program for your county. (Please continue with the same answering procedure used in SECTION II).

9. The following are features of fee hunting programs that have been proposed or instituted in other states. These features concern the control of hunters in the fee hunting area. Do you feel these features would be desirable in a fee hunting program?

	<u>Agree</u>	<u>Disagree</u>
a. All hunters with permission to use your land must wear a highly visible, standard identification device.	A	D
b. Specific areas are provided for hunter parking.	A	D
c. An agency of the local, state, or federal government handles all contact with hunters and assigns them to hunting areas.	A	D
d. Landowners handle all contact with hunters.	A	D
e. Landowners are encouraged to exclude those hunters who fail to act courteously and responsibly.	A	D
f. Discrimination against hunters on the basis of race, religion, or national origin is strictly prohibited.	A	D
g. Reservations for hunting on your land are required in advance.	A	D
h. The number of hunters on your land at a given time is limited.	A	D
i. Additional law enforcement officers are added during hunting seasons.	A	D

10. How much income per year would be a reasonable return for fee hunting on your land? (Please check only one answer)
- a. ☐ 50¢ - \$1.00 per acre      b. ☐ \$1.01 - \$3.00 per acre  
 c. ☐ \$3.01 - \$5.00 per acre      d. ☐ \$5.01 - \$7.00 per acre  
 e. ☐ \$7.01 - \$9.00 per acre      f. ☐ Over \$9.00 per acre
- (Please specify) \_\_\_\_\_ per acre

11. Would you be willing to spend some time each year to provide wildlife food and cover for the level of income checked in question 10?

a. ☐ Yes                      b. ☐ No

12. What is the maximum number of hunting parties per week that you feel you could accommodate at the income level checked in question 10? Assume two to four hunters per party.

a. ☐ 1 to 4 per week      b. ☐ 5 to 10 per week  
 c. ☐ 11 to 15 per week      d. ☐ 16 to 20 per week  
 e. ☐ Makes no difference how many

13. The following methods of setting and collecting fees from hunters have been proposed or instituted in other states. Assuming your income to be the level checked in question 10, indicate your feelings regarding each method as you did in question 9.

	<u>Agree</u>	<u>Disagree</u>
a. You, the landowner, set fees for hunting on your land.	A	D
b. Standard maximum and minimum fees are agreed on by you and other participating landowners.	A	D
c. Standard maximum and minimum fees are set by an agency of the local, state, or federal government.	A	D
d. Each landowner collects his own fees.	A	D
e. An agency of the local, state, or federal government collects the fees then distributes them to the landowner according to the number of hunters using his land.	A	D
f. An agency of the local, state, or federal government pays landowner, before the hunting season, for their participation in the fee hunting program. The agency collects fees from the hunters.	A	D
g. Landowners in a local area appoint or hire an agent to collect fees from hunters and distribute them among cooperating landowners.	A	D

- h. Hunting privileges on your land or on a group of properties including your land are leased or rented to groups of hunters for an extended period. A            D

14. Is possible liability for hunters' injuries on your land an important consideration? (Please check one answer)

- a. ☐ Yes                      b. ☐ No

If you answered Yes, which of the following methods of liability protection would you prefer? (Check more than one only if you find two methods equally acceptable).

- a. ☐ Purchase liability insurance yourself.  
 b. ☐ Incorporate your land.  
 c. ☐ State law relieving you of liability for hunters.  
 d. ☐ Make hunters pay you for liability insurance.  
 e. ☐ Make hunters sign an agreement relieving you of liability.

#### SECTION IV

The following question concerns the possible effects of a standardized program for promotion and management of hunting on private land in your county. Such a program would provide much better control over hunters than in the past, but it would probably attract many more hunters to the area. This type of program may or may not involve income to the landowners. (Please circle "A" (Agree) or "D" (Disagree) as before.

15. Below is a list of the possible effects of a standardized program to promote and manage hunting in your county. Which of these effects would be important to you in deciding whether or not to participate in such a program?

	<u>Agree</u>	<u>Disagree</u>
a. More effective enforcement of trespass laws.	A	D
b. Personal inconvenience caused by increased numbers of people coming into your county.	A	D
c. More effective enforcement of game laws.	A	D
d. Personal inconvenience caused by hunters asking to use your land.	A	D
e. Additional income for you from hunters.	A	D
f. More business opportunities for local residents.	A	D
g. Possible damage to local property.	A	D
h. More jobs for local young people from increased business.	A	D

	<u>Agree</u>	<u>Disagree</u>
i. Demands on local services such as road repair and police caused by the numbers of people coming into the area.	A	D
j. Reduction of problems between landowners and hunters.	A	D
16. Certain land management practices are used to benefit wildlife on private land, such as planting cover strips, preserving fencerows, and the like. Below is a list of possible effects of good game management in conjunction with a program to promote and manage hunting in your county. Which of these effects would be important to you in deciding whether or not to do something to increase wildlife on your property. Assume that professional advice would be available to you, free of charge.		
	<u>Agree</u>	<u>Disagree</u>
a. Seeing more wildlife on your land.	A	D
b. Time and money spent on wildlife management.	A	D
c. Better hunting for yourself and your friends.	A	D
d. Slightly lower total crop production.	A	D
e. More hunters wanting to use your land.	A	D
f. Beneficial effects of wildlife management practices on soil conservation.	A	D
g. Increased income for you from wildlife from fee hunting.	A	D

## SECTION V

Your answers in this section will be very important to the effectiveness of this study. Of course, these answers as well as the rest of your answers will be held strictly confidential. (Please check the appropriate answers).

- \* 17. How much land do you own in Huron, Sanilac, or Tuscola counties?
- |   |                            |
|---|----------------------------|
| a. _____ 50 to 139 acres                          | b. _____ 140 to 259 acres  |
| c. _____ 260 to 499 acres                         | d. _____ 500 or more acres |
| e. Do you reside on this land? _____ Yes _____ No |                            |
- \* 18. How do you use your land?
- |  |
|--|
| a. _____ Farming by yourself.  |
| b. _____ Farming by yourself and your relatives owning land nearby.                  |
| c. _____ Rent or lease it to others for farming.                                     |
| d. _____ Government set-aside or land-retirement program.                            |
| e. _____ Other use (timber, personal pleasure, etc.) (Please describe briefly) _____ |

- \* 19. If your land is farmed, what is the main product?
- a. \_\_\_\_\_ Dairy products      b. \_\_\_\_\_ Cash field crops
- c. \_\_\_\_\_ Livestock      d. \_\_\_\_\_ A mixture of products with no  
single main product. (Please describe the  
products) \_\_\_\_\_
- e. \_\_\_\_\_ Other products. (Please describe) \_\_\_\_\_
20. Besides the land you own, do you farm land which you rent or  
lease from others?
- a. \_\_\_\_\_ Yes      If yes, how many acres \_\_\_\_\_
- b. \_\_\_\_\_ No
- \* 21. Are you presently
- a. \_\_\_\_\_ Employed full-time      b. \_\_\_\_\_ Employed part-time
- c. \_\_\_\_\_ Unemployed      d. \_\_\_\_\_ Retired
- \* 22. Approximately what proportion of your income do you earn from  
your land?
- a. \_\_\_\_\_ All      b. \_\_\_\_\_ None      c. \_\_\_\_\_ About half
- d. \_\_\_\_\_ More than half      e. \_\_\_\_\_ Less than half
- \* 23. What was your age as of your last birthday:
- a. \_\_\_\_\_ 18 to 30      b. \_\_\_\_\_ 31 to 40      c. \_\_\_\_\_ 41 to 50
- d. \_\_\_\_\_ 51 to 60      e. \_\_\_\_\_ 61 or older
- \* 24. How many years of school have you successfully completed? (Please  
circle the highest year which you have completed in each category  
attended).
- | <u>School</u>       | <u>Years Completed</u> |
|---------------------|------------------------|
| Elementary          | 1 2 3 4 5 6 7 8        |
| High School         | 1 2 3 4                |
| Vocational Training | 1 2 3 4 5 6 7 8        |
| College             | 1 2 3 4 5 6 7 8        |
25. Please check the space indicating your approximate income.
- a. \_\_\_\_\_ less than \$3,000
- b. \_\_\_\_\_ \$3,000 to \$5,999
- c. \_\_\_\_\_ \$6,000 to \$9,999
- d. \_\_\_\_\_ \$10,000 to \$14,999
- e. \_\_\_\_\_ \$15,000 to \$24,000
- f. \_\_\_\_\_ more than \$25,000

- \* 26. Would you like a summary of the results of this survey when it is completed?

a. \_\_\_\_\_ Yes                      b. \_\_\_\_\_ No

If yes, please complete your mailing address in the space provided at the bottom of the page. The address will be used only to mail the results.

Thank you for your patience and cooperation.



## APPENDIX B

Questionnaire Cover Letter

## APPENDIX B

### QUESTIONNAIRE COVER LETTER

Dear Landowner:

Just as your land produces income for you, it and the other private land in Michigan produce wildlife which provides pleasure, recreation, and economic benefits to hundreds of thousands of Michigan residents. Unfortunately, public demands for wildlife such as hunting, bird-watching, and nature hiking, sometime conflict with your rightful uses of the land. As a student in the Department of Fisheries and Wildlife at Michigan State University, I am concerned that Michigan's wildlife resources be managed to the benefit of landowners and the public alike. Without your cooperation and satisfaction, any attempt to solve this problem will be fruitless. I am doing research in your area to find out how you feel about the situation so that your opinions can be a positive influence on those who are seeking the answers.

The enclosed questionnaire concerns your attitudes about hunting on your land. I am asking for the assistance of only a small group out of the thousands of landowners in this area, so your answers are essential to insure that the results are accurate. I trust that you will see the importance of this research and will thoughtfully complete and return the questionnaire at your earliest convenience. Feel free to include any comments about the research or about hunting on your land by using the backs of the questionnaire pages.

Thank you very much.

Sincerely,

Jon Parker  
Graduate Research Assistant

## APPENDIX C

Reminder Postcard for Questionnaire

APPENDIX C

REMINDER POSTCARD FOR QUESTIONNAIRE

Dear Landowner:

Several weeks ago, you received a questionnaire from Michigan State University concerning hunting on your land. Although I have heard from about one-third of the landowners contacted, I need your response in order to make accurate conclusions. If you have not responded, would you take a few moments to fill out as much of the questionnaire as you see fit and return it as soon as you can. Thank you.

Sincerely,

Jon Parker  
Graduate Research Assistant

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