THE SOCIO-ECONOMIC IMPACT OF THE COYOTE IN OKLAHOMA

By

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TABLE OF CONTENTS

Chapter Page

IV. (Continued)

LIST OF TABLES

CHAPTER I

INTRODUCTION

Predator control has become a highly sensitive issue due largely to society's increasing concern for wildlife and the environment. Today, the coyote control controversy is one of the most polarized issues facing wildlife managers, livestock owners, and society in general.

In the past, coyote "management" consisted almost entirely of control. This emphasis resulted from domestic livestock losses attributed to the coyote. Early studies reflected this view, characterized by Presnall's (1949) statement that predator control policy should be based more upon economics rather than aesthetic considerations. Most predator research was confined to the coyote's negative effects.

In 1964, the Leopold report recommended that broad socio-economic studies of the coyote be initiated. The report advised that the studies include "positive consideration to the esthetic, recreational, and ecologic value of the animals as well as to measure the negative and destructive values" (Leopold 1964:42). In 1971, the Cain committee cited the need for "studies of the intrinsic recreational and aesthetic value (of predators) to the general public," as well as the livestock losses caused by each of the major predators (Cain et al. 1972:12). Other authors (Berryman 1972, Howard 1974, Knowlton 1972, Latham 1971, Macabe and Kozicky 1972, Nobe 1971) have also stressed this need for

broad socio-economic studies of the predator-livestock controversy.

Certainly the coyote has been an economic liability to livestock owners throughout the western states. But more and more people are becoming interested primarily in the positive values of wildlife and question the necessity of predator control programs which result in the reduction of wildlife numbers (Cummings 1971).

Sound management of the coyote should depend, to a large degree, upon evaluations of the animal in terms of its overall social and economic impact. Unfortunately, there seems to be no mechanism for taking the positive social values of the coyote into account when formulating predator control policy.

This study examines three aspects of the coyote-man interaction in Oklahoma. An attempt was made to determine statewide public perception of and recreational preference for the coyote. This aspect was considered most important in terms of its immediate value to the wildlife manager and recreation manager alike. Second, a specific segment of Oklahoma coyote sport hunters (members of 10 Oklahoma Fox and Wolf [(sic)] Hunting Associations) were surveyed to measure the amount of time and money these hunters spent while pursuing their sport in 1975. Finally, the study includes a survey of a portion of Oklahoma cattle and sheep growers to ascertain the gross income lost and relative percentage of livestock losses attributed to coyote depredation in 1975. Analyses of these three facets provides a more extensive measure of the socio-economic impact of the coyote in Oklahoma. Results of the study can be used to refine the goals of coyote management by providing a broader basis from which sound management decisions can be made.

Aesthetic-Recreational Value of the Coyote

Much of the research concerning the non-consumptive recreational aspects of wildlife has been initiated only recently. A major reason for this increased research interest is the dramatic surge in the public use of wildlife for aesthetic-recreational pursuits (Schweitzer et al. 1973, and Talbot 1974).

An economic survey of wildlife-oriented recreation in the southeast showed that aesthetic enjoyment activity days accounted for almost five times as many days as fishing and over eight times as many days as hunting. Average monetary benefits averaged higher per individual for aesthetic enjoyment than fishing or hunting (Horvath 1974). The growth rate of non-consumptive recreation is exceeding that of consumptive recreation (Wilkins 1971). In 1965, over 3 million individuals reported photographing birds or other wildlife forms (USDI 1966). During the same year over 20 million took part in nature walks during the same period (USDI 1972). By the year 2000 Shaffer and Moeller (1974) feel that photographing and observing will become the primary social attraction of wildlife.

With the increased interest in non-hunting and non-fishing outdoor activities the future wildlife resource manager must be able to meet the needs of <u>both</u> the consumptive and non-consumptive wildlife resource user. If he or she is to accomplish this, a reorientation towards a broadening of input sources to existing and future management programs must be achieved. Information gathered from all segments of the public regarding perception of, and preference for wildlife resources should be one of our initial concerns. Partly due to increased media exposure, social attitudes towards and perception of

predators such as the coyote seem to be changing more rapidly than attitudes toward more "traditional" wildlife species such as deer and squirrel. Many authors recognize the positive aesthetic-recreational value that many people place on predators (Balser 1974, Berryman 1972, Cain et al., 1972, Evanson 1967, Knowlton 1972, Latham 1971, Leopold 1964), and have called for research designed to determine the level of public preference on the basis of these values.

Coyote Sport Hunting

The potential value of the coyote for sport hunting has been widely discussed (Broadbent 1971, Cain et al. 1972, Evanson 1967, Henderson 1972, Leopold 1964, Nielson 1973, Orent 1972, Rieder 1966, Wade 1973). Colorado wildlife management officials note that harvestable supplies of certain predators in Colorado are not being fully utilized. The Colorado Department of National Resources plans to attempt to increase the demand for sport hunting for certain predators, including the coyote (Colorado Div. of Wildlife 1974). In North Dakota, interest in predator sport hunting actually exceeds that for certain game species (Stuart 1971).

Although the sport hunting potential of the coyote is generally recognized, its actual role in supplying recreational opportunities to the sport hunter is not well understood. Representative studies from Kansas (Henderson and Gier 1970), Missouri (Krause et al. 1969), and Nebraska (Lock 1974) have attempted to obtain a profile of the coyote sport hunter including the time and money expended in pursuing his sport. Henderson and Gier (1970) estimated an average of 150,000 active coyote hunters in Kansas during the month of June.

Among coyote sport hunters in Oklahoma and many other states there exists two fairly well-defined types of hunters: the caller-shooter and so-called "houndman". The caller-shooter utilizes certain types of calls, simulating the squeal of a rabbit in distress, to lure the coyote within shooting range. The houndmen use dogs almost exclusively while hunting or "running" coyotes. This second group of hunters can be further divided according to the types of dogs used. One segment of the houndmen employs "sight hounds", breeds requiring direct sighting of quarry such as greyhounds and/or wolfhounds, to run down and kill coyotes usually on open, flat terrain. The other segment of the houndmen utilize "trail hounds", breeds developed for tracking and endurance, typically Walker or July hounds, to track coyotes over longer distances and for longer periods of time. These hunters typically hunt in more hilly, highly vegetated areas where visibility is limited. A third group uses a combination of trail and sight hounds. All three types of houndmen have "mechanized" the sport by using trucks equipped with CB radios to keep in touch with other hunters on foot.

Henderson and Gier (1970) noted that in eastern Kansas trail hounds are the most popular dogs used to hunt coyotes. Over the flat areas of central and western Kansas a combination of trail and sight hounds is the most popular selection among hunters. The authors also reported that in 1969, Kansas hunters (387 answering surveys and no distinction between different types of hunters) reported spending an average of $465.00 per hunter. The total number of days hunted was 16,004. Total harvest was reported at 12,964 coyotes or

33.2 coyotes per hunter. The average amount of money spent on each coyote harvested was $14.00. In Nebraska, of a projected 30,455 coyote hunters (all types of hunters), those hunting coyotes specifically as opposed to those hunting coyotes along with other animals, or those hunting coyotes while engaged in other activities such as farm work reported an average seasonal bag of 2.61 coyotes for 8.34 days of hunting (Lock 1974). Coyote hunters in Missouri reported an average harvest of 0.20 coyotes per day for 8.66 days of hunting (Krause et al. 1969).

In Oklahoma, houndmen (almost exclusively trail dog hunters) have formed at least nine regional and one statewide fox and wolf hunting clubs. Members of these Oklahoma coyote sport hunting organizations refer to themselves as "wolf" hunters. Ellis and Cowley (1968) estimated a total of 22,100 fox and "wolf" hunters in Oklahoma during 1967. The hunters participating in the Ellis and Cowley survey reported spending an average of 8 to 10 days per month hunting or running coyotes. The average fox and wolf hunter spent a total of $1,054.55 in 1967 on coyote hunting alone. The authors also estimated that the coyote provided over a million man-days of recreation for all fox and wolf hunters in Oklahoma. Ellis (1972) reports in his questionnaire survey of the Oklahoma quail hunter that 16.3 percent of 3,410 respondents, a total of 556 (again with no distinction between types of coyote hunters), reported hunting coyotes.

Some authors (Anon.1974, Beasom 1974, Evanson 1967, Hornocker 1972, Leopold 1964, Orent 1972) have also expressed a belief that predator sport hunting is an effective tool for reducing domestic livestock losses to wild predators.

Coyote Depredation Assessment

Heavy livestock losses have been attributed to the coyote. Among studies conducted primarily by the sheep and cattle producing industries, Reynolds and Gustad (1971) estimated the total value of sheep lost to predators in 16 western states to be almost $17 million per year. The range sheep industry in Idaho reported gross income reduction to coyotes totaling $574,487 in 1970-71 and $789,531 in 1972-73 (Early et al. 1974a, 1974b). Twenty-one percent of the total lamb losses in Idaho were attributed to predators in 1970-71 and 25 percent in 1972-73. Coyotes were blamed for 84 percent of all losses to predation in 1972-73.

Neilson and Curle (1970) calculated total direct losses to the Utah range sheep industry at $1,109,274 for the fiscal year 1969. Projected losses for the New Mexico livestock industry were calculated at $1,826,458 per year. Coyote depredations in New Mexico accounted for an estimated 55 percent of the ewe loss, and 76 percent of the lamb loss (Anon. 1973). Nesse (1974) found the total direct losses to predators within one county in California to be $30,000. Wyoming ranchers reported sheep losses of $1,641,000 to coyotes in 1972 (Anon. 1974). In an independent analysis of domestic livestock losses to wild predators, Evanson (1967) estimated $4 to 10 million in losses per year for all western states.

In Oklahoma, total reported domestic livestock losses attributed to wild predators was $33,779 in 1971, making the state number one in cattle losses, and $19,362 in 1972. These total reported losses placed the state sixth and tenth respectively, among all states

reporting total livestock losses (U.S. House 1973). Oklahoma ranked third in terms of total cattle lost during the first quarter of 1973 (U.S. Senate 1973).

CHAPTER II

METHODS

Objective A - Perception and Preference

The sample for the statewise survey of Oklahoma residents was drawn using a modified multi-stage stratified probability technique. The state was divided into seven regions: Northwest (NW), Southwest (SW), Central (CE), Southeast (SE), Northeast (NE), Oklahoma City (OC), and Tulsa (TU). Existing boundaries of the Oklahoma Department of Wildlife Conservation Commission Districts were modified slightly to form the seven regions. Conservation Districts VI and VII were combined to form the SW study region. In addition, Tulsa and Oklahoma City were set apart from District I NE region and District V - CE region, respectively. For the purpose of this study the Oklahoma City and Tulsa regions are defined as urban regions; the other five regions are considered rural.

Total population and percentage of the state population were calculated for each region. A sample population, equal to the region's percentage of the total state population was allocated to each region. All available telephone directories in the Oklahoma State University Library were listed according to county and study region. From this list six to eight counties were chosen randomly for the NE, SE, SW, NW, and CE regions. Eight cities and towns, varying in population size, were then randomly selected from these counties within each study region.

The sample size of each region was divided equally among the eight cities and towns.

Individual respondents from each city or town were chosen by the skip interval method (T. Kielhorn, Personal communication, 1975). The total number of names, pages, etc., in each telephone directory, voter registration list, or other listing of potential respondents, is divided by the total number of respondents to be selected for the survey. This value is called the "skip interval." The total number of pages in each city telephone directory selected for inclusion in the study was then divided by the number of respondents to be sampled from that city. The first respondent was selected from a random position on the first page of the directory (e.g., top of second column, bottom of first column, etc.), the skip interval is then used to select the remaining respondents. Assume a skip interval of nine (e.g., 81 page directory and a total of nine respondents to be chosen from that directory). The next respondent would be located on page 10 (page 1 plus the skip interval 9), at the randomly selected position on that page. The next respondent would be located on page 19, and so on. The names and addresses thus generated were transferred to IBM computer cards. Self-adhesive address labels were then prepared by the Oklahoma State University Computer Center.

A modified semantic differential technique was used to measure public perception and preference. Semantic differential is a multi-dimensional technique of attitude measurement. It assumes that attitudes and preferences exhibit multi-dimensionality and can be measured semantically (Schiff 1971). Osgood et al. (1965) have defined three basic dimensions or factors in an attitude or preference:

(a) the evaluative factor that can be represented by the response of an individual to such adjective pairs as good-bad, ugly-beautiful, etc., (b) the potency factor, represented by the response to adjective pairs like strong-weak, hard-soft, etc., and (c) the activity factor, represented by the response to adjective pairs such as active-passive, hot-cold, etc. (See Osgood et al. 1965, for a more extensive (description of the method).

Utilizing word pairs from all three factors provides a more complete measure of an attitude or preference but requires fairly extensive data analysis including a variety of multi-variate statistical techniques. Due to the exploratory nature of the survey an effort was made to simplify data analysis and provide a more intensive measure of how attitudes or perceptions of individuals toward the coyote and other survey species varied over one of the three factors. For these reasons the bi-polar word pairs selected for use in the questionnaire are assumed to group under the evaluative factor.

The questionnaire form (Appendix A) modified from Sonnenfeld (1967, personal communication 1974) contains photographs of nine wildlife species: raccoon (Procyon lotor), bobcat (Lynx rufus), mourning dove (Zenaidura macroura), whitetail deer (Odocoileus virginianus), bobwhite quail (Colinus virginianus), eastern fox squirrel (Sciurus niger),red-tail hawk (Buteo jamaicensis), eastern cottontail rabbit (Sylvilagus floridanus), and coyote (Canis latrans).

Individual species were chosen, rather than species groups such as raptors, songbirds, etc., to help maintain consistency in data

analysis and to yield a survey sensitive to more specific aesthetic-recreational preferences of the public. In addition, all species chosen for the survey are relatively familiar to the general public. The distribution of the nine species within Oklahoma is similar and most are within relatively easy recreational reach of the general public. Most importantly, the species selected are all assumed to possess some aesthetic-recreational appeal.

In the cover letter, respondents were informed that this survey was attempting to measure the recreational value of all nine species. No mention was made of the specific research interest in public perception of, and preference for the coyote.

Beneath each species photograph is a series of six bi-polar word pairs; ugly-beautiful, boring-fascinating, worthless-valuable, repulsive-attractive, harmful-beneficial, and dull-exciting. These word pairs are arranged at the opposite ends of a five position scale. A numerical value was assigned to each of the five positions ranging from a value of one at the negative end (eg. ugly, boring, worthless, repulsive, harmful, and dull) to a value of five at the positive end of the scale (eg. beautiful, fascinating, valuable, attractive, beneficial, and exciting). The order of positive and negative terms were randomly reversed to avoid all positive words being located at one end of the scale and all negative words at the other. Survey respondents were asked to mark the position on each of the word pair scales that most nearly represented the way he or she felt the word pair applied to the animal pictured.

The questionnaire also contains two opinion statements concerning increased attention and a voluntary public contribution fund specifically for non-game wildlife management. Individuals are asked to respond along a five point scale from "strongly agree" to "strongly disagree." One other question asks the respondent to rank the same nine wildlife species pictured in the survey in the order that he or she would most like to see or hear them when on a walk or a drive.

The remaining questions were designed to determine certain aspects of the respondents background and allow stratification of the survey respondents into a number of geographical, social and recreational categories. These categories include: geographical study region, livestock owner, rural-urban, and four levels of participation in outdoor recreation activities (both consumptive and non-consumptive).

One-half of the questionnaires contained photographs that were labelled by species and the other half were left unlabelled. This was done in an attempt to measure any potential bias due to response to the "word" concept alone.

Response scores were summed for all respondents over each word pair. In addition, the six word pairs under each species photograph were summed for all respondents. This latter value will be referred to as "species-total." Mean scores and standard deviations were also calculated for all word pairs and species-total scores. Total score, mean and standard deviation were also calculated for the two non-game management opinion statements and the species preference

ranking question. The total sample population was further analyzed by all social, geographical and recreational stratifications previously listed.

Individual word pairs, species-total, and ranking mean scores for the coyote were compared to all other species included in the questionnaire for all respondents and selected survey stratifications. Response to the coyote alone was further analyzed according to the study stratifications listed above.

All calculations were performed with the aid of a Statistical Analysis system (SAS) program developed from Service (1972). The program was run on an IBM 370 computer.

The questionnaire was pre-tested on a sub-sample of 200 selected by the same technique used on the main sample. An additional 35 known livestock owners were added (5 to each region) to the main study due to a low response rate from livestock owners. The main sample size was 1000. The results of the pre-test were included in the main study because the sampling technique was identical and the questionnaire format was the same in both the pre-test and main sample. This resulted in a total mail out of 1,235 questionnaires (1,000 main study, 200 pre-test, and 35 additional livestock owners). The initial main study mailing was made with a follow-up three weeks later (Appendix A). Due to time, financial limitations, and the questionnaire format, no attempt was made to measure non-response bias. The final response was as follows:

1.	Number of questionnaires mailed out	1,235	
	(a) minus questionnaires returned as undeliverable	10	
	(b) minus questionnaires returned with major portions incomplete	7	
	Sub total	1,218	
2.	Usable sample (1,235 minus 17)	1,218	(100%)
	(a) usable returns		
	first mailing	200	(16.4%)
	second mailing	133	(10.9%)
	Total	333	(27.3%)

Objective B - Coyote Sport Hunting

The Oklahoma State Fox and Wolf Hunting Association provided their membership roster in addition to membership lists from affiliated Oklahoma fox and wolf hunting organizations. After an initial screening for duplicates, the hunters' names and addresses were transferred to IBM computer cards. The cards were sorted alphabetically and checked again for duplicate names. Self-adhesive address labels were then prepared by the Oklahoma State University Computer Center. A total of 883 names and addresses were available for the study sample.

Development of the questionnaire incorporated both consultation with hunters and a pre-test. Hunters were contacted regarding the appropriateness of the existing questionnaire. The hunters were given the opportunity to suggest additional questions that might be included in the questionnaire.

The questionnaire consists of nineteen questions. Many of these questions are broken down into component parts (Appendix B). A

majority of the questions are designed to evaluate a number of hunter socio-economic characteristics. Time and financial expenditures were the main characteristics measured. The remaining questions were (1) How many years has the respondent been hunting coyotes? (2) In what season and county does the hunter spend most of his or her time hunting? (3) What methods did he or she use to hunt coyotes? (including how many, and what type of dogs used). (4) Is interest in coyote sport hunting increasing, decreasing or remaining about the same from year to year? (5) Did the hunter help any farmer or ranchers who had a problem with coyotes? (6) What is the popularity of other game animals among the hunters (measured by requesting respondents to rank the game animals in the order that the hunters most enjoy hunting them)? (7) Whether or not the hunter would like to have the coyote placed on the list of game animals in Oklahoma? (8) How much Oklahoma livestock damage, on a scale of 1 to 5, does the respondent feel the coyote is responsible for? The last question space was left open for any additional comments the respondent might wish to add.

Results of the survey were hand calculated and verified using a Texas Instruments SR-51-11 calculator.

The questionnaire was pre-tested on a sub-sample (200) of the hunters. With no revision in questionnaire format, a total of 883 questionnaires (including the pre-test) were mailed out. A follow-up mailing was completed three weeks later (Appendix B). Due to time and financial limitations, no attempt was made to measure non-response bias. The final response was as follows:

1.	Number of questionnaires mailed out	883
	a. minus questionnaires returned as undeliverable	10
	b. minus questionnaires returned with major portions incomplete	7
	Sub total	886
2.	Usable sample (883 minus 17)	886 (100%)
	a. usable returns	
	first mailing	207 (23.9%)
	second mailing	106 (12.2%)
	Total	313 (36.1%)

Objective C - Livestock Depredation

With the help of the Oklahoma Cattlemens Association, 12 cattle breeder associations were contacted and requested to send copies of their most recent membership lists. Lists were obtained from seven of the 12 state cattle breeder associations originally contacted. Dr. Robert Noble of Oklahoma State University Animal Sciences Department provided the membership lists of the Oklahoma Sheepgrowers Association. All lists were checked for duplicates and the remaining names and addresses were transferred to IBM computer cards. Self-adhesive address labels were then prepared by the Oklahoma State University Computer Center. Names of 557 cattlemen and 540 sheep owners were available for the survey.

Both cattle owner and sheep owner questionnaires were prepared after consultation with Mr. James Nix, Agricultural Economist for the United States Department of Agriculture in Washington, D. C., and research faculty of the Oklahoma State Department of Animal Sciences.

Most of the loss data from studies within the livestock industry have been gathered by questionnaire-personal interview survey. Utilizing this survey method a potential exists for loss reporting bias attributed to many causes (Cain et al. 1972, Evanson 1967, Leopold 1964). The questionnaire method was selected because it allows more extensive data collection in a shorter period and provides results that can be compared to similar studies in Oklahoma and surrounding states.

The questionnaire (Appendix C) requested respondents to supply livestock inventory totals for January 1, 1975 and January 1, 1976. In addition, livestock owners surveyed were asked to report total losses in calendar year 1975 for the following causes: all unknown losses, all known loss categories including disease-poison, weather, coyote, dog, bobcat, unknown predator, and theft. Cattlemen were asked to total each of the above losses for cattle, calves before weaning, and calves after weaning. Sheep owners were asked to total the losses for sheep, lambs-before docking, and lambs-after docking. Three questions were also included to answer the following study questions:

1. What kind of cow/calf or lambing facilities were used in 1975?
2. In what county did the respondent keep his or her livestock in 1975?
3. How much Oklahoma livestock damage, on a scale of 1 to 5, does the respondent feel the coyote is responsible for?

The back of the questionnaire was left open for any additional comments the respondent might wish to add.

Results of the survey were hand calculated with a Texas Instrument SR-51-11 calculator.

Total losses, average losses, and percentage of total losses were calculated for all loss categories for both cattle and sheep. These figures were then sub-divided by geographic region and type of cow/calf or lambing facility. The gross income-lost approach (Early et al. 1974a) was used to estimate the economic impact of losses to all causes, including losses attributed to coyote depredations. Total losses were then multiplied by a fixed value per animal. The fixed value was provided by the Oklahoma Crop and Livestock Reporting Service.

A total of 1,097 questionnaires (557 cattle growers and 540 sheep growers) were mailed out. An initial mailing was completed along with one follow-up three weeks later (Appendix C). Due to time and financial limitations, no attempt was made to measure non-response bias. The final response was as follows:

	Cattle	Sheep
1. Number of questionnaires mailed out	557	540
a. minus questionnaires returned undeliverable	6	5
b. minus questionnaires returned with major portions incomplete	6	32
Sub total	545	503
2. Usable sample	545 (100%) (557 minus 12)	503 (100%) (540 minus 37)
a. usable returns first maining	100 (18.3%)	75 (14.9%)
second maining	60 (11.0%)	34 (6.7%)
Sub total	160 (29.3%)	109 (21.7%)
Total		269 (25.7%)

CHAPTER III

RESULTS AND DISCUSSION

Objective A

Because of the large amount of data generated by the questionnaire, results were consolidated and are presented in the following three main sections.

1. The social, geographical, and recreational breakdown of the survey respondents.
2. How the response to the coyote compared with the response to the eight other species among all respondents and among some of the social geographical, and recreational stratifications of the survey.
3. How the response to the coyote varied among all respondents and among the social, geographical, and recreational stratifications of the survey.

To provide a more usable interpretation of the data, an attempt was made to identify trends in response among the survey stratifications.

Social, Geographical, and Recreational Stratifications of the Survey Respondents

Urban respondents (124) made up 38.2 percent of the survey respondents. Twenty-five percent (80) of the respondents reported

owning livestock. Male respondents (240) returned 74 percent of the usable questionnaires.

The seven geographical regions comprised the following percentages of the total returns: Oklahoma City (OC)-21 percent, Tulsa (TU)-16.9 percent, Northwest (NW)-10.8 percent, Northeast (NE)-16.9 percent, Southwest (SW)-15.1 percent, Southeast (SE)-8.3 percent, Central (CE)-10.8 percent. Response rates from the geographical regions are presented in Table I. The urban (OC, TU) response rate was 28.4 percent as opposed to 25.7 percent for the rural households sampled. Respondents from individual strata are assumed to be representative of that special segment of the population within a typical stratified random sampling procedure. When this assumption is made, response data from each strata are weighted according to the percentage of the sample population each strata occupies.

The respondents from each geographical region were not assumed to be representative of the population of the region due to the slightly modified character of the sampling technique used in this study. Therefore, although the survey sample was intentionally stratified geographically by population, responses from individual study regions were not weighted.

Hunters and fishermen comprised 64.6 percent of the survey respondents. Seventy-seven percent of the respondents reported engaging in outdoor recreation activities other than hunting and fishing.

Table I. Response to perception/preference questionnaire by Oklahoma geographical regions, 1975.

Region	Mail-out	Useful returns	Percent returned
SW	196	49	25.0
NW	96	35	36.4
NE	195	55	28.2
SE	104	27	25.9
CE	190	35	18.2
TU	188	55	29.2
OC	249	69	27.7
Total	1218	325	26.7

How the Response to the Coyote Compared With the Response to the Eight Other Species Over All Respondents and Some Social, Geographical, and Recreational Stratifications of the Survey

Total questionnaires returned by all respondents, mean scores, and standard deviations for all word pairs, species-totals (total of all word pair scores for each species) preference rank (question #9) over all survey species, and response to the non-game opinion statements, are presented in Tables II and III.

All survey species were perceived positively (mean response > 3.00) over all word pairs with one exception. The coyote received a mean response of 2.99 over word pair harmful-beneficial, with the highest standard deviation recorded for any word pair (1.34) among all respondents. The implications of the response to the word pair harmful-beneficial for the coyote to the coyote-livestock controversy will be discussed in detail in the next section.

Among all respondents, the white-tailed deer received the most positive mean scores on word pairs ugly-beautiful, boring-fascinating, worthless-valuable, repulsive-attractive, and dull-exciting. The bobwhite quail was scored the most positive on the harmful-beneficial scale. The coyote received the lowest mean scores of all survey species over all word pairs.

By species-total mean score, the nine survey species ranked in the following order (species-total mean in parenthesis): 1. Deer (27.35) (30 highest possible), 2. Quail (26.37), 3. Squirrel (26.07), 4. Dove (24.94), 5. Raccoon (24.56), 6. Rabbit (24.05), 7. Hawk (23.21), 8. Bobcat (22.73), 9. Coyote (20.61).

Table II. Mean score and standard deviation of 273 respondents on each survey species, for all word pairs and species-totals, Oklahoma, 1975.

	Mean Score	Standard deviation
Raccoon		
Ugly-beautiful	4.23	0.83
Boring-fascinating	4.41	0.86
Worthless-valuable	3.81	1.06
Repulsive-attractive	4.26	0.84
Harmful-beneficial	3.70	1.08
Dull-exciting	4.12	0.80
Species-total	24.56	3.79
Bobcat		
u-b	4.10	1.02
b-f	4.12	1.06
w-v	3.35	1.20
r-a	4.00	1.05
h-b	3.13	1.27
d-e	4.02	1.04
Species-total	22.73	5.22
Dove		
u-b	4.53	0.76
b-f	4.07	0.98
w-v	4.00	0.99
r-a	4.40	0.81
h-b	4.07	0.94
d-e	3.89	0.95
Species-total	24.94	4.30
Coyote		
u-b	3.48	1.21
b-f	3.82	1.23
w-v	3.19	1.34
r-a	3.44	1.18
h-b	2.99	1.34
d-e	3.67	1.16
Species-total	20.61	6.05

TABLE II (Continued)

	Mean Score	Standard deviation
Squirrel		
u-b	4.56	0.71
b-f	4.65	0.70
w-v	4.00	0.97
r-a	4.59	0.65
h-b	3.90	0.95
d-e	4.35	0.80
Species total	26.07	3.50
Deer		
u-b	4.86	0.41
b-f	4.67	0.60
w-v	4.42	0.81
r-a	4.71	0.58
h-b	4.15	0.96
d-e	4.55	0.66
Species-total	27.35	2.97
Quail		
u-b	4.51	0.81
b-f	4.36	0.82
w-v	4.38	0.81
r-a	4.48	0.74
h-b	4.15	0.85
d-e	4.33	0.81
Species-total	26.37	3.92
Hawk		
u-b	3.64	1.41
b-f	4.14	1.11
w-v	3.83	1.19
r-a	3.78	1.14
h-b	3.89	1.15
d-e	3.93	1.05
Species-total	23.21	5.79

TABLE II (Continued)

	Mean Score	Standard deviation
Rabbit		
u-b	4.26	0.80
b-f	4.16	0.86
w-v	3.81	1.05
r-a	4.19	0.75
h-b	3.72	1.01
d-e	3.90	0.87
Species-total	24.05	4.17

Table III. Preference mean rank score, number of respondents, standard deviation, and response to nongame opinion statements (Appendix A), of all respondents, Oklahoma, 1975.

Species	No. of Respondents	Mean Score	Standard Deviation
Raccoon*	274	4.88	2.15
Bobcat	"	6.12	2.56
Dove	"	4.99	2.40
Deer	"	2.57	2.11
Quail	"	3.76	2.27
Coyote	"	6.90	2.05
Squirrel	"	3.99	2.07
Hawk	"	6.21	2.15
Rabbit	"	5.56	2.32
Non-game Funding	326	3.63	0.97
Non-game Attention	326	3.74	0.95

* Species are listed in the order that they appeared in questionnaire.

Using a simple difference of means test (t-test), examination of mean scores reveals that significant differences ($P < 0.05$) in mean scores do exist between, but not within, the mean scores for the five following species categories: deer; quail and squirrel; dove, raccoon, and rabbit; hawk and bobcat; and coyote (Table IV). This species categorization, or clumping, suggests that respondents may perceive certain groups of animals in the same way.

Table IV. Significant differences in species-total mean scores and preference mean rank, of all respondents, Oklahoma, 1975.

Species	Species-total mean
Deer	27.35
Quail	26.37
Squirrel	26.07
Dove	24.94
Raccoon	24.56
Rabbit	24.05
Hawk	23.21
Bobcat	22.73
Coyote	20.61

Any pair of means enclosed by the range of any one line are not significantly different (P. <0.05)

The distribution of species-total mean scores for each species is presented in Table V. The three predators in the study were the only species to receive species-total mean scores of less than 10. This suggests that a certain percentage of the public still retain negative attitudes about predators.

In response to question #9 ("Rank the following animals in the order that you would most like to see or hear when on a walk or a drive"), the nine species were ranked as follows (preference mean rank in parenthesis): 1. Deer (2.56), 2. Quail (3.76), 3. Squirrel (3.99), 4. Raccoon (4.89), 5. Dove (4.99), 6. Rabbit (5.56), 7. Bobcat (6.12), 8. Hawk (6.21), 9. Coyote (6.89).

Significant differences ($P < 0.05$) in mean scores were noted between, but not within, the mean scores for the following species categories; deer; quail and squirrel; dove, raccoon, and rabbit; hawk and bobcat; and coyote (Table IV).

Survey respondents recorded positive agreement mean scores with both non-game management opinion statements. Question # 1, favoring a system where an individual could contribute money to go toward the conservation and management of non-game animals, received a mean score of 3.63 (5-strongly agree, 1-strongly disagree). The mean score for Question # 2 (non-game animals should receive more attention from public and private conservation organizations than they now get) was 3.74 (Table III).

Table V. Distribution of species-total mean scores for all survey species among all respondents, Oklahoma, 1975.

Species	Species-total mean score and (percentage of response)				
	6-10	11-15	16-20	21-25	26-30
Raccoon	0	4(1.5)	35(12.8)	121(44.3)	113(41.4)
Bobcat	8(2.9)	12(4.4)	58(21.2)	109(39.9)	86(31.5)
Dove	0	6(2.2)	40(14.7)	96(35.2)	131(47.9)
Coyote	19(6.9)	32(11.7)	75(27.5)	85(31.1)	62(22.7)
Squirrel	0	1(0.4)	24(8.8)	81(29.7)	167(61.2)
Deer	0	0	6(2.2)	62(22.7)	205(75.1)
Quail	0	3(1.1)	30(10.9)	70(25.6)	170(62.3)
Hawk	8(2.9)	17(6.2)	58(21.2)	80(29.3)	110(40.3)
Rabbit	0	3(1.1)	59(21.6)	110(40.3)	101(37.0)

Species-total mean scores from respondents who received questionnaires with the photographs labelled (by species) were significantly higher for three of the nine survey species (Table VI). Significant differences ($P<0.05$) existed between squirrel, dove, and raccoon mean scores on labelled and unlabelled questionnaires. Species-total mean score for the coyote was not significantly different ($P<0.05$) for survey respondents who returned questionnaires with species photographs unlabelled and those who returned labelled questionnaires.

No radical differences in perception of the nine survey species were noted among individual survey stratifications. Some differences in perception of the coyote relative to the other survey species will be presented here but specific response to the coyote will be discussed in greater detail in sub-section III.

Analysis of the two-way survey stratifications (rural-urban and livestock owner-all other respondents) response to the coyote, relative to the eight other survey species, will be limited to a statistical examination of significant differences in response ranking by species-total mean score and to a presentation of ranking by preference mean score (Question #9). The analysis is limited because of the amount of data generated, and the need to help identify overall trends in response. Response to the two non-game management opinion statements (Questions # 1&2) will also be examined.

Analysis of multiple stratifications (seven geographic regions and four levels of participation in consumptive and non-consumptive outdoor recreation) will be limited to a presentation of ranking by (a) species-total mean score and (b) preference mean score.

Response to the nongame opinion statements will also be presented.

Urban and Rural Respondents. No significant differences in ranking of the nine survey species by species-total mean scores was noted between urban and rural respondents (Table VII). Both groups perceived the deer most positively and coyote least positively.

Statistical examination of species-total mean score among rural respondents revealed that significant differences ($P < 0.05$) do exist between, but not within, the following species categories: deer; quail and squirrel; dove, rabbit, and raccoon; hawk and bobcat; and coyote.

Significant differences ($P < 0.05$) between species-total mean scores, as recorded by urban respondents revealed a slightly different species categorization (Table VII).

Rural respondents ranking by preference mean score differed slightly from urban respondents. Survey respondents from rural households preferred the squirrel second behind the deer (Table VII). Urban respondents preferred the rabbit sixth highest (over the hawk and bobcat). Urban respondents preferred the hawk and bobcat sixth and seventh, respectively, preferring the rabbit eighth.

Both urban and rural respondents exhibited positive agreement ($X > 3.00$) mean scores for both non-game management opinion statements.

The mean response score (3.77) for question # 1 (private financial contributions to nongame management programs) recorded by urban respondents was significantly higher ($P < 0.05$) than the response (3.55) recorded by rural respondents. This indicates that

Table VI. Preception ranking by species-total mean score of all respondents returning questionnaires with species photographs labelled and unlabelled, Oklahoma, 1975.

Labelled questionnaires		Unlabelled questionnaires		Significant difference ($P < 0.05$)
Species	Mean Score	Species	Mean Score	
Deer	27.04	Deer	27.53	
Quail	26.03	Quail	26.58	
Squirrel	25.33	Squirrel	26.52	*
Dove	24.13	Dove	25.43	*
Raccoon	23.96	Raccoon	24.92	*
Rabbit	23.53	Rabbit	24.37	
Hawk	22.85	Hawk	23.42	
Bobcat	22.64	Bobcat	22.79	
Coyote	20.90	Coyote	20.43	

Table VII. Perception and preference ranking of nine survey species by species-total mean score and preference mean rank of urban and rural respondents showing significant differences of means within each ranking. Mean response to nongame opinion statements, Oklahoma, 1975.

Urban (n=109)		Rural (n=163)	
Deer	26.88	Deer	27.64
Quail	26.14	Quail	26.51
Squirrel	25.46	Squirrel	26.49
Dove	24.85	Dove	24.97
Raccoon	24.75	Rabbit	24.53
Hawk	23.56	Raccoon	24.40
Rabbit	23.18	Hawk	22.93
Bobcat	22.90	Bobcat	22.58
Coyote	20.44	Coyote	20.73

Any pair of means enclosed by the range of any one line are not significantly different ($P < 0.05$).

urban dwellers might be more responsive to public funding for nongame wildlife conservation and management.

Livestock Owners. No significant differences in ranking order of the nine survey species by species-total mean score was noted between livestock owners and all other respondents (Table VIII). Both groups scored deer most positively and coyote least positively. Statistical examination of differences between species-total mean scores of livestock owners revealed that respondents owning livestock tended to perceive the nine species in groups or clusters slightly different than all other respondents. Significant differences ($P < 0.05$) do exist between, but not within, the following species categories: deer, quail and squirrel; raccoon, rabbit, dove, bobcat, and hawk; and coyote.

Preference mean rank scores (Question # 9) produced an almost identical species ranking for both livestock owners and all other respondents. Livestock owners' mean preference scores ranked the bobcat higher than the hawk, the reverse of the ranking by all other respondents (Table VIII).

A significance difference ($P < 0.05$) was noted between mean scores for livestock owners and all other respondents in response to the non-game opinion statements (Questions 1 and 2). Both groups recorded positive agreement mean scores but respondents not owning livestock exhibited a significantly higher positive response to both questions than livestock owners indicating a higher degree of concern for non-game wildlife among persons not owning livestock than

Table VIII. Perception and preference ranking of nine survey species by species-total mean score and preference mean rank of livestock owners and all other respondents showing significant differences of means within each ranking. Mean response to nongame opinion statements. Oklahoma, 1975.

Species Total Mean			
Livestock owners (n=64)		All other respondents (n=208)	
Deer	27.33	Deer	27.35
Quail	26.69	Quail	26.28
Squirrel	25.84	Squirrel	26.14
Raccoon	23.86	Dove	25.35
Rabbit	23.80	Raccoon	24.76
Dove	23.59	Rabbit	24.14
Bobcat	23.45	Hawk	23.41
Hawk	22.64	Bobcat	22.53
Coyote	20.30	Coyote	20.69

Any pair of means enclosed by the range of any one line is not significantly different (.05 level).

among livestock owners.

Respondents reporting not owning livestock perceived the nine survey species in the following general species categories: deer; quail and squirrel; dove and raccoon; raccoon and rabbit; hawk and bobcat; and coyote.

Geographical Stratifications. The white-tailed deer received the highest positive mean score of all survey species from all geographical regions (Table IX). The NW (Northwest) region perceived the deer more positively (but not significantly higher) than any other region. Species-total mean score among NW respondents was 28.03 out of a possible 30. The coyote was perceived least positively among survey species by all geographical regions. The SE (Southeast) region perceived the coyote least positive among regions (19.28) while the highest positive perception score for the coyote was recorded by SW (Southwest) respondents (21.73).

When asked to rank the survey species in the order they would most like to see or hear them (Question # 9), the deer was the most preferred of all nine species among all regions but the NW (Table X). The bobwhite quail was the most preferred species among NW respondents. The coyote was preferred least among the nine survey species by respondents from the SW, SE, TU (Tulsa), and OC study regions. The NW, NE (Northeast), and SE regions preferred the coyote eighth among the nine survey species, preferring the hawk last in all three cases. The highest preference mean score for the coyote was recorded by the SE region (6.27).

Table IX. Perception ranking of nine survey species by species-total mean score by Oklahoma geographical region, 1975.

SW (n=37)		NW (n=28)		NE (n=45)	
Deer	27.86	Deer	28.03	Deer	27.42
Squirrel	26.89	Quail	26.29	Quail	27.00
Quail	26.13	Squirrel	25.68	Squirrel	26.82
Dove	25.35	Rabbit	24.82	Dove	25.66
Raccoon	24.64	Dove	24.21	Rabbit	25.29
Rabbit	24.35	Raccoon	23.68	Raccoon	24.71
Hawk	24.13	Hawk	22.39	Hawk	23.24
Bobcat	23.05	Bobcat	21.79	Bobcat	22.40
Coyote	21.73	Coyote	20.69	Covote	21.27

SE (n=25)		CE (n=28)		TU (n=48)		OC (n=61)	
Deer	27.72	Deer	27.25	Deer	26.42	Deer	27.24
Quail	27.04	Squirrel	26.29	Quail	25.93	Quail	26.29
Squirrel	26.44	Quail	25.96	Squirrel	24.60	Squirrel	26.13
Raccoon	24.60	Dove	24.85	Dove	24.39	Raccoon	25.62
Dove	24.12	Rabbit	24.17	Raccoon	23.65	Dove	25.21
Rabbit	23.48	Raccoon	24.14	Rabbit	23.23	Hawk	23.88
Bobcat	21.84	Bobcat	23.67	Hawk	23.14	Bobcat	23.75
Hawk	21.04	Hawk	23.07	Bobcat	21.81	Rabbit	23.44
Coyote	19.28	Coyote	19.89	Coyote	20.29	Coyote	20.56

Table X. Preference ranking of nine survey species by preference mean rank and response to nongame opinion statements by Oklahoma geographical region, 1975.

SW (n=41)		W (n=32)		NE (n=39)		SE (n=22)		CE (n=32)		TU (n=48)		OC (n=58)	
Deer	2.85	Quail	3.47	Deer	2.10	Deer	2.00	Deer	2.22	Deer	2.53	Deer	2.62
Squirrel	3.22	Squirrel	3.50	Quail	3.74	Quail	3.82	Quail	3.87	Quail	3.55	Quail	4.02
Quail	3.71	Deer	3.50	Squirrel	3.77	Squirrel	4.09	Squirrel	4.06	Squirrel	4.60	Squirrel	4.31
Dove	4.65	Rabbit	4.41	Raccoon	4.69	Raccoon	4.82	Raccoon	4.65	Dove	4.71	Raccoon	4.60
Rabbit	4.85	Raccoon	5.03	Dove	4.95	Dove	5.73	Dove	5.00	Raccoon	5.00	Dove	5.15
Raccoon	5.46	Dove	5.09	Rabbit	5.41	Rabbit	5.91	Bobcat	5.75	Rabbit	5.79	Hawk	5.35
Hawk	6.41	Bobcat	6.22	Bobcat	6.64	Bobcat	5.95	Rabbit	6.00	Bobcat	5.96	Bobcat	5.67
Bobcat	6.85	Coyote	6.81	Coyote	6.82	Coyote	6.27	Hawk	6.06	Hawk	6.04	Rabbit	6.19
Coyote	6.93	Hawk	6.97	Hawk	6.87	Hawk	6.41	Coyote	7.28	Coyote	6.77	Coyote	7.07
Non-game Funding	3.61 n-49	Non-game Funding	3.54 n=35	Non-game Funding	3.62 n=55	Non-game Funding	3.59 n=27	Non-game Funding	3.34 n=35	Non-game Funding	3.69 n=55	Non-game Funding	3.83 n=69
Non-game Attention	3.84 n=49	Non-game Attention	3.49 n=35	Non-game Attention	3.80 n=55	Non-game Attention	3.70 n=27	Non-game Attention	3.69 n=35	Non-game Attention	3.74 n=55	Non-game Atten.	3.83 n=69

All study regions recorded positive agreement mean scores for both non-game opinion statements (Table X). OC respondents registered a higher positive response (3.83) to a voluntary contribution program for non-game management and conservation than any other geographical region. This indicates more willingness to support financially non-game among OC residents. In terms of increased attention for non-game species from public and private conservation organizations, the SW and OC regions recorded the highest positive responses (SW-3.84, OC-3.83).

Hunters and Fisherpersons--Non-Hunters and Non-Fisherpersons. Table XI contains the ranking by species-total mean score, for respondents who reported four different levels (A = no days; B = 1-14 days, C = 15-28 days, D = 29 or more days) of hunting and/or fishing activity in one year.

Those respondents who reported spending no days hunting and/or fishing in one year perceived the survey species in the same order (by species-total mean score) as ranked over all survey respondents. The deer was perceived most positively among non-hunters and non-fishermen and the coyote least positively.

Table XII contains the ranking by preference mean and response to the nongame for opinion statements respondents reporting four levels (as described above) of hunting and/or fishing activity per year. Those reporting no hunting or fishing activity per year preferred the nine wildlife species in the same order as perceived by species-total mean score. In response to both non-game opinion statements, non-hunters and non-fisherpersons recorded high positive agreement. Mean response to question # 2, increased attention

Table XI. Perception ranking of nine survey species by species-total mean score among Oklahoma respondents reporting four levels of participation in hunting and/or fishing per year, 1975.

No participation in hunting and/or fishing (n=90)		1-14 days hunting and/or fishing (n=86)		15-28 days hunting and/or fishing (n=53)		29 or more days hunting and/or fishing (n=43)	
Deer	27.31	Deer	27.31	Deer	26.77	Deer	28.19
Quail	26.14	Quail	26.48	Quail	25.98	Squirrel	27.63
Squirrel	25.90	Squirrel	26.07	Squirrel	25.11	Quail	27.14
Dove	25.42	Raccoon	24.84	Dove	24.17	Raccoon	25.44
Raccoon	24.38	Dove	24.77	Raccoon	23.64	Dove	25.21
Rabbit	24.15	Rabbit	23.94	Rabbit	23.62	Bobcat	25.02
Hawk	22.46	Hawk	23.59	Hawk	22.68	Hawk	24.77
Bobcat	22.10	Bobcat	23.29	Bobcat	21.13	Rabbit	24.65
Coyote	20.45	Coyote	20.53	Coyote	18.79	Coyote	23.25

Table XII. Preference ranking of nine survey species by preference mean score among Oklahoma respondents reporting four levels of participation in hunting and/or fishing per year, 1975.

No participation in hunting and/or fishing (n=88)		1-14 days hunting and/or fishing (n=91)		15-28 days hunting and/or fishing (n=49)		29 or more days hunting and/or fishing (n=46)	
Deer	2.65	Deer	2.69	Deer	2.04	Deer	2.72
Quail	3.97	Quail	3.68	Quail	3.22	Squirrel	3.43
Squirrel	4.14	Squirrel	4.04	Squirrel	4.14	Quail	4.09
Dove	4.44	Raccoon	4.98	Raccoon	4.96	Raccoon	4.96
Raccoon	4.70	Dove	5.01	Dove	5.24	Bobcat	5.54
Rabbit	5.30	Rabbit	5.74	Rabbit	5.47	Dove	5.74
Hawk	6.16	Hawk	5.86	Bobcat	5.98	Rabbit	5.80
Bobcat	6.36	Bobcat	6.25	Hawk	6.69	Coyote	6.26
Coyote	7.25	Coyote	6.69	Coyote	7.24	Hawk	6.46
Non-game Funding	3.82 (n=115)	Non-game Funding	3.64 (n=101)	Non-game Funding	3.42 (n-57)	Non-game Funding	3.46 (n=52)
Non-game Attention	3.86 (n=115)	Non-game Attention	3.68 (n=101)	Non-game Attention	3.56 (n=57)	Non-game Attention	3.78 (n=52)

for non-game species, (3.86) was the second highest mean score recorded by any of the survey stratifications. The highest score being recorded by respondents who participated in 29 or more days of non-hunting or non-fishing outdoor recreation.

Significant differences in perception of, or preference for the nine species were not noted among respondents who reported no hunting and/or fishing activity, those who reported hunting and/or fishing 1-14 days per year, and those who hunted and/or fished 15-28 days per year. Deer was perceived and preferred most positively and coyote least positively among the latter two groups. The species-total mean score recorded by persons who hunt or fish 15-28 days annually was 18.79 for the coyote. This mean score was the lowest recorded on the coyote by any of the survey stratifications.

Among respondents reporting hunting or fishing 29 days or more days annually, the coyote was perceived more positively by species-total mean score (although still ranked last) than by any other survey stratification except respondents who reported 29 or more days of non-consumptive outdoor recreation.

By preference ranking mean score, those reporting 29 or more days of hunting and/or fishing preferred the coyote eighth among the nine species.

All hunters and/or fisherpersons recorded positive agreement for both nongame opinion statements. Mean response to the nongame funding opinion statement (Question # 1) was significantly lower ($P < 0.05$) than the mean response from non-hunters and non-fisherpersons. Evidently, non-hunters and non-fisherpersons were more willing than hunters and fishermen to spend money on nongame

species. There were no significant difference between the two groups in response to increased attention for nongame opinion statement (Question # 2).

The lack of definitive perceptual/preferential differences among respondents might be interpreted two ways. The possibility exists that modification of the Semantic Differential technique, as used in the study, may have rendered the technique insensitive to actual differences in perception that may exist among the survey respondents.

Assuming that no significant perceptual and/or preferential differences for the nine survey species do exist among the respondents, the survey results suggest that Oklahomans' in general, may exhibit a relatively homogenous or non-selective perception of and recreational preference for wildlife resources.

How the Response to the Coyote Varied Over All Respondents and the Social, Geographical, and Recreational Stratifications of the Survey

Table XIII contains the mean scores, species-total, and standard deviations for all word pairs, species-total, and preference rank for response to coyote over all questionnaires returned. Initial examination of results revealed a wider range of variation in response to word pair harmful-beneficial for coyote than the other word pairs. Therefore, this response was analysed in greater detail than the response to other word pairs.

Table XIII. Response to coyote (word pairs, species-total, and preference rank) survey respondents of several categories, Oklahoma, 1975.

Response Category	Mean	Standard Deviation
All Respondents		
Ugly-beautiful	3.48	1.21
Boring-fascinating	3.82	1.23
Worthless-valuable	3.19	1.34
Repulsive-attractive	3.44	1.18
Harmful-beneficial	2.99	1.34
Dull-exciting	3.67	1.16
Species total	20.61	6.05
Preference rank	6.90	2.05
Rural Respondents		
Ugly-beautiful	3.52	1.24
Boring-fascinating	3.76	1.27
Worthless-valuable	3.26	1.34
Repulsive-attractive	3.40	1.19
Harmful-beneficial	3.07	1.34
Dull-exciting	3.69	1.21
Species total	20.73	6.10
Preference rank	6.86	2.02
Urban Respondents		
Ugly-beautiful	3.41	1.16
Boring-fascinating	3.92	1.18
Worthless-valuable	3.09	1.35
Repulsive-attractive	3.50	1.17
Harmful-beneficial	2.87	1.35
Dull-exciting	3.64	1.08
Species-total	20.44	6.02
Preference rank	6.93	2.11

TABLE XIII (Continued)

Response Category	Mean	Standard Deviation
Livestock Owners		
Ugly-beautiful	3.42	1.29
Boring-fascinating	3.64	1.30
Worthless-valuable	3.24	1.34
Repulsive-attractive	3.36	1.24
Harmful-beneficial	2.91	1.45
Dull-exciting	3.72	1.20
Species-total	20.30	6.54
Preference	6.91	2.03
All other respondents		
Ugly-beautiful	3.49	1.19
Boring-fascinating	3.88	1.21
Worthless-valuable	3.17	1.16
Repulsive-attractive	3.46	1.16
Harmful-beneficial	3.02	1.31
Dull-exciting	3.65	1.14
Species-total	20.69	5.92
Preference rank	6.89	2.08
Male respondents		
Ugly-beautiful	3.46	1.17
Boring-fascinating	3.86	1.19
Worthless-valuable	3.17	1.35
Repulsive-attractive	3.40	1.15
Harmful-beneficial	2.99	1.38
Dull-exciting	3.69	1.10
Species-total	20.58	5.91
Preference rank	6.68	2.15

TABLE XIII (Continued)

Response Category	Mean	Standard Deviation
Female respondents		
Ugly-beautiful	3.53	1.34
Boring-fascinating	3.72	1.35
Worthless-valuable	3.25	1.33
Repulsive-attractive	3.55	1.25
Harmful-beneficial	2.99	1.25
Dull-exciting	3.64	1.31

All word pairs, except harmful-beneficial of the coyote received positive ($\bar{X} > 3.00$) mean response scores over all questionnaires returned. Word pair harmful-beneficial of the coyote received a mean response score of 2.99 (standard deviation of 1.34) over all respondents.

Urban and Rural Respondents. Table XIII contains the mean scores, and standard deviations for all word pairs, species-total, and the preference rank to the coyote as recorded by urban and rural respondents. No significant differences ($P < 0.05$) in perception (i.e., response to word pairs, species-total) or preference for the nine species between urban and rural respondents were noted.

Both urban and rural respondents recorded positive mean scores on all word pairs to the coyote with one exception. Urban respondents recorded a slightly negative mean score (2.87) over word pair harmful-beneficial. Rural response to the word pair harmful-beneficial was 3.07.

The standard deviations for mean response score for harmful-beneficial to the coyote among urban respondents (1.35) and rural respondents (1.34) were also the highest recorded for all word pairs.

The lack of significant differences in perception of the coyote among urban and rural respondents might be explained to two ways. The possibility exists that modification of the Semantic Differential technique, as used in the study, reduced the sensitivity of the technique to a point where it was unable to detect actual differences in perception that may actually exist among urban and rural

respondents. Another possible explanation for the similar perceptions recorded by rural and urban respondents in the typical rural-urban dichotomy of Oklahoma households. The relatively clear geographical, social, economic, and sometimes philosophical divisions that are assumed to exist between urban dwellers and their rural counterparts, especially in the eastern part of the U.S., are not so evident in Oklahoma.

Livestock Owners. No significant differences in perception of or preference for the nine species were noted between livestock owners and all other respondents over word pairs, species-total, or preference rank (Table XIII). Both livestock owners and all other respondents recorded positive word pair mean scores with one exception. Livestock owners recorded a slightly negative mean score (2.91) on word pair harmful-beneficial with a standard deviation of 1.45. All other respondents recorded a mean response of 3.02 with a standard deviation of 1.31. The difference is not statistically significant ($P < 0.05$).

Male and Female Respondents. No significant differences were noted over word pairs or species-total, between male and female respondents (Table XII). The coyote was perceived positively by both male and females over all word pairs except one. Both male and female respondents recorded 2.99 mean scores on word pair harmful-beneficial.

Male respondents exhibited more preference for the coyote by ranking the coyote (6.68) significantly higher ($P < 0.05$) than

did females (7.47) when they ranked the survey species in the order they would most like to see or hear when on a walk or drive.

No significant differences in response to the coyote were noted among geographical regions among all word pairs, species-totals, or preference rank (Table XIV). The SE region had the lowest mean response score for word pair harmful-beneficial (2.64) and the highest standard deviation (1.52). Individual ranchers in the southeast have reported unusually high livestock losses to predators (see Objective C). This could account for the "harmful" perception and high standard deviation of the response to the coyote among southeast respondents. The SW region recorded the highest mean response to word pair harmful-beneficial (3.35). The SE region exhibited the least positive perception of the coyote among regions (lowest species-total mean score (19.28) for the coyote) but seemed to prefer the coyote more than the other regions (highest preference mean rank, (6.27)).

This seeming contradiction might be explained by the fact that southeast Oklahoma respondents tended to prefer (by preference rank) all species slightly more than all other regions. The coyote may have been "swept along" with the resulting higher preference score than recorded for the coyote by any other region.

Hunters and/or Fisherpersons and Non-Hunters and Non-Fisherpersons. Respondents who reported hunting and/or fishing 29 or more days per year recorded the highest mean score for word pair harmful-beneficial

Table XIV. Mean response and standard deviation (in parentheses) for coyote word pairs, species-total, and preference rank by Oklahoma geographic region, 1975.

Region	Ugly-beautiful	Boring-fascinating	Worthless-valuable	Repulsive-attractive	Harmful-beneficial	Dull-exciting	Species-total	Preference rank
NW	3.25 (1.08)	3.75 (1.38)	3.36 (1.19)	3.32 (1.22)	3.29 (1.38)	3.71 (1.08)	20.68 (5.76)	6.81 (1.87)
SW	3.76 (1.16)	3.84 (1.24)	3.48 (1.26)	3.59 (1.17)	3.35 (1.25)	3.62 (1.28)	21.73 (5.71)	6.93 (1.91)
CE	3.32 (1.44)	3.57 (1.34)	3.14 (1.56)	3.18 (1.31)	3.03 (1.29)	3.64 (1.25)	19.89 (7.03)	7.28 (1.61)
SE	3.48 (1.19)	3.52 (1.33)	3.04 (1.40)	3.12 (1.17)	2.64 (1.52)	3.48 (1.33)	19.28 (6.75)	6.27 (2.37)
NE	3.64 (1.32)	3.95 (1.17)	3.22 (1.35)	3.60 (1.14)	2.98 (1.29)	3.89 (1.15)	21.27 (5.67)	6.82 (2.31)
TU	3.33 (1.26)	3.79 (1.22)	3.21 (1.34)	3.44 (1.15)	2.89 (1.32)	3.63 (1.04)	20.29 (6.18)	6.77 (2.24)
OC	3.48 (1.09)	4.02 (1.15)	3.00 (1.37)	3.56 (1.19)	2.85 (1.39)	3.65 (1.12)	20.56 (5.95)	7.07 (2.01)

for the coyote of all survey stratifications and second highest mean scores over all other than word pairs (Table XV). The mean response to word pair harmful-beneficial among hunter and fisherpersons who reported 29 or more days (3.63) was significantly higher ($P < 0.05$) than the mean score of non-hunters-nonfisherpersons (2.90) and hunters and/or fisherpersons who reported 1-14 (2.98) or 15-28 (2.66) days afield per year. This response to word pair harmful-beneficial will be discussed in greater detail in the next section.

Species-total mean score recorded by hunters and/or fisherpersons who reported 29 or more days afield per year (23.25) was the second highest record by any survey stratification and significantly higher ($P < 0.05$) than species-total mean score recorded by non-hunters/non-fisherperson, and respondents who reported 1-14 or 15-28 days of activity per year.

Preference mean rank of hunters and/or fisherpersons reporting 29 or more days afield was the highest recorded by any survey stratification and significantly higher ($P < 0.05$) than preference mean rank recorded by non-hunters and/or non-fisherpersons and hunters and/or fisherpersons reporting 15-28 days afield per year.

These results suggest that the more active hunters and fisherpersons appreciate both game and nongame, and to a higher level than non-hunters and non-fisherpersons.

Table XV. Mean response and standard deviation for coyote word pairs, species-total and preference rank of four reported levels of hunting and/or fishing per year.

Response category	Mean	Standard Deviation
NO DAYS HUNTING AND/OR FISHING PER YEAR		
Ugly-beautiful	3.51	1.21
Boring-fascinating	3.79	1.29
Worthless-valuable	3.20	1.32
Repulsive-attractive	3.48	1.16
Harmful-beneficial	2.90	1.30
Dull-exciting	3.58	1.18
Species-total	20.45	6.02
Preference rank	7.25	1.82
1-14 DAYS HUNTING AND OR FISHING PER YEAR		
Ugly-beautiful	3.56	1.22
Boring-fascinating	3.81	1.13
Worthless-valuable	3.13	1.23
Repulsive-attractive	3.42	1.18
Harmful-beneficial	2.98	1.35
Dull-exciting	3.64	1.11
Species-total	20.53	5.94
Preference rank	6.69	2.00
15-28 DAYS HUNTING AND/OR FISHING		
Ugly-beautiful	3.00	1.18
Boring-fascinating	3.66	1.37
Worthless-valuable	2.85	1.38
Repulsive-attractive	3.11	1.15
Harmful-beneficial	2.66	1.34
Dull-exciting	3.51	1.19
Species-total	18.79	6.22
Preference rank	7.24	2.23

TABLE XV (Continued)

Response category	Mean	Standard Deviation
29 OR MORE DAYS HUNTING AND/OR FISHING		
Ugly-beautiful	3.84	1.11
Boring-fascinating	4.14	1.10
Worthless-valuable	3.70	1.46
Repulsive-attractive	3.79	1.67
Harmful-beneficial	3.63	1.29
Dull-exciting	4.12	1.07
Species-total	23.25	5.42
Preference rank		

Participation in Outdoor Recreation Other Than Hunting or Fishing. Survey respondents who reported 29 or more days of non-consumptive outdoor recreation recorded the highest mean scores among all survey respondents for word pairs ugly-beautiful (3.85), boring-fascinating (4.34), worthless-valuable (3.73), repulsive-attractive (3.90), and dull-exciting (4.22). Species-total mean score (23.41) among respondents reporting 29 or more days participating in outdoor recreation other than hunting or fishing was also the highest recorded in any survey stratification.

Respondents reporting no participation in outdoor recreation recorded slightly negative mean scores for word pairs coyote: worthless-valuable (2.69) and harmful-beneficial (2.73) (Table XVI). Respondents who reported 1-14 days of participation recorded a slightly negative mean score for word pair harmful-beneficial (2.80).

Mean scores for the word pairs boring-fascinating, worthless-valuable, repulsive-attractive, harmful-beneficial, dull-exciting, and species-total mean recorded for the coyote by respondents reporting 29 or more days of non-consumptive outdoor recreation per year were significantly higher than the mean scores recorded by respondents reporting three lower levels of participation in outdoor recreation other than hunting or fishing.

As noted earlier, these results suggest that more ardent outdoor enthusiasts perceive and prefer the coyote more positively than other respondents.

Table XVI. Mean response and standard deviation of coyote word pairs, species-total, and preference rank at four reported levels of participation in outdoor recreation other than hunting and/or fishing.

Response category	Mean	Standard Deviation
NO DAYS OUTDOOR RECREATION OTHER THAN HUNTING AND/OR FISHING		
Ugly-beautiful	3.51	1.27
Boring-fascinating	3.45	1.46
Worthless-valuable	2.67	1.42
Repulsive-attractive	3.31	1.41
Harmful-beneficial	2.72	1.47
Dull-exciting	3.37	1.37
Species-total	19.10	6.79
Preference rank	7.04	1.95
1-14 DAYS PARTICIPATION IN OUTDOOR RECREATION OTHER THAN HUNTING AND/OR FISHING		
Ugly-beautiful	3.27	1.26
Boring-fascinating	3.60	1.23
Worthless-valuable	3.03	1.31
Repulsive-attractive	3.23	1.16
Harmful-beneficial	2.80	1.31
Dull-exciting	3.45	1.11
Species-total	19.40	5.97
Preference rank	7.16	1.90
15-28 OR MORE DAYS PARTICIPATION IN OUTDOOR RECREATION OTHER THAN HUNTING AND/OR FISHING		
Ugly-beautiful	3.33	1.01
Boring-fascinating	4.03	0.94
Worthless-valuable	3.31	1.01
Repulsive-attractive	3.31	0.85
Harmful-beneficial	3.11	1.03
Dull-exciting	3.67	0.99
Species-total	20.75	3.82
Preference rank	6.81	2.06

TABLE XVI (Continued)

Response category	Mean	Standard Deviation
29 OR MORE DAYS PARTICIPATION IN OUTDOOR RECREATION OTHER THAN HUNTING AND/OR FISHING		
Ugly-beautiful	3.85	1.13
Boring-fascinating	4.34	1.00
Worthless-valuable	3.73	1.30
Repulsive-attractive	3.90	1.05
Harmful-beneficial	3.41	1.37
Dull-exciting	4.22	0.95
Species-total		
Preference rank	6.37	2.31

Objective B

The hunters surveyed in this study represent a specialized group of coyote sport hunters. No attempt will, or should be made to extrapolate these findings to coyote sport hunters in general. The results of the study should only be extrapolated to members of Oklahoma Fox and Wolf hunting organizations.

Returns were received from respondents who hunted in 67 (87%) of the 77 state counties. Results of the coyote sport hunter questionnaire survey are presented in the following four main sections:

1. The hunter, his hunting methods, coyote harvest, and the location and seasons hunted in 1975.
2. Time expenditures, hunting equipment, and facilities.
3. Financial expenditures.
4. Hunter preferences and attitudes.

The Hunter, His Hunting Methods, Coyote Harvest, and the Location and Season He Hunted in 1975

The average survey respondent had been hunting coyotes for 30.1 years. Respondents were members of an average of 2.6 Oklahoma coyote sport hunting organizations. Of those hunters responding, 99.4 percent (305) hunted with trail hounds (typically Walker or July hounds) and 8.1 percent (25) hunted with sight hounds (typically Greyhounds). The method of calling and shooting coyotes was used by 2.0 percent (9) of the respondents. Four hunters (1.3 percent) reported tracking coyotes by themselves. Five respondents (1.6 percent) used a vehicle to flush coyotes.

While hunting coyotes, 277 (89.9 percent) respondents reported using only dogs. Rifles, shotguns, and handguns in addition to dogs, were used by 18 (5.8 percent), 2 (0.6 percent), and 17 (5.5 percent) hunters, respectively. One hunter (0.3 percent) reported using a bow and arrow to hunt coyotes.

In the spring and fall of each year the fox and wolf hunting clubs hold organized events called field trials and bench shows. These are weekend events combining a dog show with a hunting trial. Dogs are judged on their looks along with their ability to track and run coyotes. The dog show is usually held on Friday afternoon. Early Saturday and Sunday morning all the dogs competing in the field trial are released with a number painted on the side of each dog. Judges and dog owners in trucks follow the dogs over the countryside by way of county roads keeping in touch with each other by CB radios. The judges score the dogs on their tracking ability with a two-day score determining the overall winner.

Hunting in groups during field trials was reported by 153 respondents (52.0 percent). Hunting with a group while not in field trials was the most popular technique. Two hundred and sixty-nine respondents (91.5 percent) reported hunting in this manner. Hunting alone was reported by 155 (52.7 percent) survey respondents.

In response to question #4d ("In what county did you do most of your hunting?"), respondents listed Osage (26 times), LeFlore (20), Logan (18), and Lincoln (14) most often.

Total coyote harvest reported by all survey respondents was 4,404, an average of 17.3 coyotes per hunter.

Spring was the most popular time of year for hunting, with 254 hunters (85.5 percent) reporting hunting during this period in 1975. Hunting during fall and winter were also popular among hunters as 223 (75.1 percent) reported hunting in the fall and 224 (75.7 percent) in winter. Hunters were not as active in summer with 147 (49.5 percent) of the respondents reporting hunting during that period. Hunting at the same intensity year around was reported by 118 (39.7 percent) of the hunters.

In 1975, 190 (66.4 percent) survey respondents reported helping ranchers or farmers who claimed they were having a problem with coyotes. Fifty-two of the sport hunters (27.4 percent) advised the rancher or farmer how to kill the coyotes. Fifty-one (26.8 percent) helped the rancher or farmer kill the coyotes and 181 (62.1 percent) reported killing the coyotes for the rancher or farmer.

Hunting Equipment, Time Expenditures, and Facilities

Respondents reported owning an average of slightly less than 10 (9.7) coyote hunting dogs at the end of 1975. Trail hounds made up 97.1 (2850) of the total 2,935 dogs reported. Sight hounds comprised 2.8 percent (83) of the total and "other" dogs 0.1 percent (2).

Owning a vehicle used solely for coyote hunting was reported by 180 (60.4 percent) respondents. Owning a trailer used only for coyote hunting was reported by 123 (40.7 percent) of the hunters. Owning both a motor vehicle and a trailer used just for coyote sport hunting was reported by 79 (26.5 percent) of the respondents.

CB radios are popular among coyote hunters as 107 (36.1 percent)

failed to locate one truck or car without a CB radio.

Away from home many hunters rent an old house and/or farm as a base camp from which to hunt and/or kennel their dogs. Of those responding, 30 (8.8 percent) reported operating such a hunting area away from home. Each hunter who operated a hunting area away from home spent an average of 102.4 days there in 1975 (a day is defined as any time spent at the area in one day).

All hunters responding (295) reported spending a total of 25,523 days afield hunting only coyotes in 1975, an average of 86.5 days per hunter. Respondents also reported driving an average of 4626.26 miles hunting coyotes in 1975. Of these 86.5 days, hunters spent an average of 33.7 days hunting coyotes (not in field trials) with other fox and wolf hunting association members, an average of 8.3 days hunting at field trials, and an average of 52.8 days hunting by themselves or with hunting companions that were not members of an Oklahoma fox and wolf hunting club. An additional average of 5.9 days were reported engaged in hon-hunting fox and wolf hunting association activities.

Respondents (131) also reported attending an average of slightly less than three (2.94) field trials in 1975.

III. Financial Expenditures

Survey respondents reported spending an average of $2,516.46 on coyote hunting in 1975, $29.09 per hunting day, and $145.46 per coyote harvested per hunter. Of this total, average dog and dog-related expenses amounted to $984.82 (39.0 percent). Gasoline and

for equipment and facilities averaged $803.41 (32.0 percent) and all other categories, $180.25 (7.2 percent) (Table XVII).

Hunters (88, 39.7 percent) who did purchase a vehicle and/or trailer in 1975 for coyote hunting spent an average of $2,471.77 on a vehicle and/or trailer. Hunters (30, 8.8 percent) who operated hunting areas away from home spent an average of $109.17 on purchase, rent, upkeep, etc. Respondents who entered field trials (131, 43.2 percent) reported spending an average of $41.67 in entrance fees. Many respondents failed to fill in list expenditures for various categories such as "gas and vehicle maintenance" and/or "all other expenses." Many hunters, contacted after the survey was completed, felt that the study expenditure estimates are conservative at best.

Hunter Preferences and Attitudes

Respondents were asked to rank a number of game and non-game species in the order the hunters most preferred hunting them (see questionnaire question # 17). Other than the coyote, the most popular and most hunted species was bobwhite quail. The quail received a mean rank of 2.59 over all respondents. More than one-half of the respondents (59.2 percent) reported hunting quail. The five most preferred species after quail, with mean rank (percent of respondents who hunted each species in parentheses) included was: squirrel 3.41 (54.2 percent), deer 3.49 (43.7 percent), bobcat 4.09 (25.3 percent), and rabbit 4.82 (24.8 percent). Respondents also reported hunting turkey, dove, ducks, geese, pheasant, prairie chicken, woodcock and snipe (Table XVIII). Eighty-one of the respondents (34.0 percent) hunted coyotes only in 1975 and eight (3.4 percent) reported hunting only coyote and bobcat.

Table XVII. Average coyote hunting expenses for members of Oklahoma fox and wolf hunting clubs, 1975.

Item	Avg. Expenditure ($)	Percent of total
Purchasing dogs	273.27	10.8
Food for dogs	590.75	23.5
Medical bill (Dogs)	86.69	3.4
Other dog supplies	34.11	1.3
Sub-total Dog-related expenditures	984.82	39.0
Purchasing a vehicle or trailer	734.85	29.2
Guns and shells	6.73	0.3
C.B. Radio	61.83	2.5
Sub-total equipment and facility expenditures	803.41	32.0
Gas & Vehicle Maintenance	547.98	21.8
Cost of hunting area	12.17	0.5
Field Trial Entrance Fees	22.87	0.9
All other expenses	145.21	5.8
Total	$2516.46	100.0

Table XVIII. Number of coyote sport hunter respondents who hunted other game and non-game species, and the preference (expressed as mean rank score) for each species, Oklahoma, 1975.

Species	Mean Rank	No. of those responding who indicated hunting	Percent of those responding who indicated hunting
Quail	2.59	141	59.2
Squirrel	3.41	129	54.2
Deer	3.49	104	43.7
Bobcat	4.09	60	25.2
Rabbit	4.82	59	24.8
Turkey	5.00	47	19.7
Dove	5.74	49	20.6
Ducks and/or Geese	5.76	47	19.7
Pheasant	6.14	29	12.2
Prairie Chicken	9.44	20	8.4
Woodcock and/or Snipe	11.33	15	6.3

Having the coyote placed on the list of game animals in Oklahoma (if the animal could be run for sport year round) was approved by 87.4 percent (256) of those surveyed. Ninety-seven of the respondents (35.4 percent) thought that interest in coyote sport hunting was decreasing. Increased costs were cited most often as the cause. Slightly less than one-fourth (24.4 percent) thought interest was increasing, and the remaining 40.2 percent felt interest in coyote sport hunting was remaining the same.

Survey respondents thought that the coyote was responsible for a minimal amount of damage to Oklahoma livestock. In response to question # 19 ("On a scale of 1 to 5, with 1 meaning no damage and 5 meaning a lot of damage, how much damage do you think the coyote does to Oklahoma livestock?"), the mean score was 1.54 over all respondents.

Objective C

Results are divided into two main sections: sheep owners and cattle owners. The main sections are further divided into the following four sub-sections.

1. Total livestock inventory, total losses for survey respondents, total losses and gross income loss estimated for all Oklahoma sheep owners and cattle owners in 1975.
2. Total losses attributed to predators by type of lambing or calving facility.
3. Total losses attributed to coyote predation by geographic region.
4. Response to coyote damage opinion question.

Sheep Owners

Total Livestock Inventory, Total Losses For Survey Respondents, Total Losses and Gross Income Lost Estimated For All Oklahoma Sheep Owners in 1975. Due to irregular loss reporting by a major portion of sheep owners no attempt was made to estimate losses for production periods (sheep, lambs before docking, and lambs after docking). Loss data include all sheep and/or lambs lost.

Questionnaires were returned by ranchers who grazed and/or quartered sheep in 41 (53.2 percent) of the 77 state counties.

The January 1, 1975, inventory total (20,323) represented 22.8 percent of all sheep and lambs present on all Oklahoma farms and ranches (89,000) (Oklahoma Crop and Livestock Rep. Service 1975) for January 1, 1975.

To gain a rough estimate of the growth or decline of the sheep industry in Oklahoma, inventory totals for January 1, 1975, and January 1, 1976, were compared. The same respondents who reported a total inventory of 20,323 sheep and lambs as of January 1, 1975, also reported a total inventory of 15,355 as of January 1, 1976. This decrease of 4,968 sheep and lambs in one calendar year represents a 24.4 percent decline in total inventory among the 92 respondents (Table XIX).

Losses of sheep by respondents totalled 2,288 for all causes, an average of 21.2 sheep and/or lambs lost per respondent. Losses attributed to predators (789) comprised 34.5 percent of the total losses. Disease and/or poison accounted for 14.5 percent; weather (105) and theft (16), together, made up 5.3 percent; all other known

Table XIX. Inventory totals and mean number of sheep and/or lambs owned by respondents for sheep and/or lamb for January 1, 1975 and January 1, 1976, in Oklahoma.

Inventory Date	No. of respondents	Total sheep and/or lambs	X
Jan. 1, 1975	92	20,323	220.9
Jan. 1, 1976	92	15,355	166.9
Difference	N/A	-4,968	-54.0
Percent change	N/A	-24.4	-24.4

causes (366) were 16.0 percent; and losses due to all unknown causes (681) accounted for 29.8 percent of the total (Table XX).

Reported coyote depredations (591) accounted for 25.8 percent of the total losses and 74.9 percent of all losses attributed to predators (Table XIX). The mean number of sheep and/or lambs lost, over all respondents, attributed to coyote depredation was 5.4 with a standard deviation of 13.87. Fifty-six respondents (50.9 percent) reported no losses to coyotes. Sheep owners who reported losses to coyotes (54, 49.1 percent) averaged 9.6 sheep and/or lambs lost to coyote depredation. Calculation of percentage of total inventory lost was restricted to sheep owners who reported an inventory for January 1, 1975. Therefore, the loss figures that follow are lower than those reported earlier in the text.

Total losses (2,056) of sheep owners reporting an inventory equalled 10.12 percent of the January 1, 1975, total inventory of 20.32 sheep and/or lambs. Losses attributed to predators (682) amounted to 3.35 percent of the total inventory. Losses due to disease and or poison (311) comprised 1.5 percent; weather (104) and theft (13), 0.6 percent; all other known causes (331), 1.6 percent; and losses due to all unknown causes (615) accounted for 3.0 percent of the total January 1, 1975, inventory. Within the losses to predators, losses attributed to coyotes (519) amounted to 2.50 percent of the inventory total; dogs (89), 0.4 percent; bobcats (33), 0.1 percent; and unknown predators (41), 0.2 percent of the January 1, 1975, inventory total (Table XXI). Percentages were taken to two decimal places for more accurate extrapolation.

Table XX. Total sheep and/or lambs lost and percent of total losses by categories for 1975 as reported by all Oklahoma sheep owners responding to the survey.

Loss Category	Total sheep and/ or lamb losses	Percent of losses to predation	Percent of total losses
Predation	789		34.5
Coyote		74.9	
Dog		14.4	
Bobcat		4.2	
Unknown Predator		6.5	
Disease-Poison	331		14.5
Weather	105		4.6
Theft	16		0.7
All other known causes	366		16.0
Unknown causes	681		29.8
TOTAL	2288		100.1

Table XXI. Percent of survey inventory lost and estimated total losses and gross income lost for all Oklahoma sheep owners by loss category for 1975.

	Percent of survey inventory lost	Total losses (est) all sheep and lamb to Oklahoma sheep industry	Gross income lost to all Oklahoma sheep owners $
Predation	3.35	2,982	79,023
Coyotes	2.55	2,270	60,155
Dogs	0.44	392	10,388
Bobcat	0.16	142	3,763
Unknown pred.	0.20	178	4,717
Disease-poison	1.53	1,362	36,093
Weather	0.52	463	12,270
Theft	0.06	53	1,404
All other known	1.63	1,451	38,451
All unknown	3.03	2,697	71,471
Total	10.12	9,008	$238,712

Total losses and gross income lost to all Oklahoma sheep owners can be estimated, by assuming the percentage of inventory losses as reported in the survey were representative of all Oklahoma sheep owners in 1975. The total inventory of 89,000 sheep and/or lambs on all Oklahoma farms and ranches (Oklahoma Crop and Livestock Reporting Service 1975) was multiplied by the percentage losses for each loss category as reported by survey respondents.

An estimate of the gross income lost to Oklahoma sheep owners was calculated by assigning a value of $26.50 per head lost. This figure represents the average value of all sheep and lambs on all Oklahoma farms and ranches as of January 1, 1975 (Oklahoma Crop and Livestock Reporting Service 1975).

Estimated total losses and gross income loss to all Oklahoma sheep owners in 1975 equalled 9,008 sheep and/or lambs lost and $238,712, respectively (Table XXI).

These totals include 2,982 sheep and/or lambs and $79,023 gross income loss attributed to predators; 1,362 sheep and/or lambs and $36,093 gross income loss to disease and/or poison; 463 sheep and/or lambs and $12,270 gross income loss due to weather; 53 sheep and/or lambs and $1,404 gross income loss due to theft; 1,451 sheep and/or lambs and $38,451 gross income loss to all other known causes; and 2,697 sheep and/or lambs and $71,471 gross income loss due to all unknown causes. Within the losses to predators, estimated losses attributed to coyotes totalled 2,270 sheep and/or lambs and a gross income loss of $60,155 to all Oklahoma sheep owners in 1975.

The estimated loss of 3.3 percent of the Oklahoma sheep inventory to predators and 2.5 percent loss to coyotes is comparable to most

recent estimates from other states. Boggess (1976) estimates 2.0 to 2.5 percent of the Kansas sheep inventory are lost to predators annually. Sheep producers in Utah reported a 3 percent loss to predators in 1968-69 (Nielson and Curte 1970). Early et al. (1974a, 1974b), estimated 3.4 percent losses attributed to predators in both 1970-1971 and 1972-1973 production cycles. U.S.D.A. (1975) estimates an average of 3.4 percent of the westwide (15 western states) sheep inventory was lost to predators in 1974.

Total Losses Attributed to Predators by Type of Lambing Facility. Two types of lambing facilities as typically utilized by Oklahoma sheep ranchers: lambing sheds, or similar sheltered areas or completely open lambing operations. Some sheep owners use a combination of the two types.

There was a significant ($P < 0.05$) difference in mean losses to all predators between the respondents reporting an open or combination of open and sheltered lambing facilities and sheep owners reporting strictly sheltered lambing facilities (Table XXII).

Total Losses Attributed to Coyote Depredation by Geographic Region. Table XXIII contains the number of respondents, total losses attributed to coyote depredation, number of sheep and/or lambs lost attributed to coyote depredation per respondent, and the percent of the total losses (all causes) attributed to coyote depredation for all geographic regions.

The southeast region reported the greatest loss per respondent and the greatest percentage of total losses attributed to coyote

Table XXII. Sheep and/or lamb and cattle and/or calf losses attributed to predators by respondents utilizing different lambing facilities.

Type of facility	No. of respondents*	Total losses (mean) attributed to Coyotes	Dogs	Bobcats	Undetermined predators	All predators
Lambing						
Sheltered/open or open	26	335 (12.9)	30 (1.2)	31 (1.2)	5 (0.2)	**401 (15.4)
Sheltered	78	251 (3.3)	67 (0.91)	2 (0.02)	18 (0.2)	**348 (4.5)
Calving						
Open/sheltered or open	121	68 (0.6)	69 (0.6)	1 (0.008)	10 (0.1)	148 (1.2)
Sheltered	24	8 (0.3)	6 (0.3)	0 (0.0)	2 (0.1)	16 (0.7

* 8 "open & sheltered" or "open" sheep owner respondents reported no losses to predators (30.8 percent)
34 "sheltered" sheep owners respondents reported no losses to predators (43.6 percent)
* 88 "open/sheltered" or "open" cattleowners respondents reported no losses to coyotes (72.7 percent)
13 "sheltered" cattleowner respondents reported no losses to coyotes (54.2 percent)
**Differences in mean significant ($P < 0.05$).

Table XXIII. Sheep and/or lamb losses attributed to coyote depredation by geographic region, Oklahoma, 1975.

Region	No. of respondents	Losses attributed to coyotes depredation	Losses per respondent	Percent of total loss
SW	37	218	5.9	32.5
NW	32	82	2.6	15.8
NE	5	2	0.4	3.8
SE	5	54	10.8	62.8
CE	26	91	3.5	19.4

depredation. Results from the southeast could have been biased by the small number of respondents (5). In addition, one respondent from the SE region reported 93 percent (50) of the total losses attributed to coyote depredation for the entire region.

The southwest and central regions recorded the second and third highest losses per respondent and percent of total losses attributed to coyote depredation, respectively.

Response to Coyote Damage Opinion Question. Respondents were asked to rank, on a scale of 1 to 5, with 1 meaning "no damage" and 5 meaning "a lot of damage," the amount of damage the respondent believes the coyote does to Oklahoma livestock (Table XXIV).

Mean response score, among all sheep owners, was 3.62. Respondents who use sheltered lambing facilities scored slightly higher (3.65) than sheep owners reporting a combination of open and sheltered facilities (3.60). The difference was not statistically significant ($P < 0.05$).

Cattle Owners

Total Livestock Inventory, Total Losses For Survey Respondents, Total Losses and Gross Income Lost Estimated For All Oklahoma Cattle Owners in 1975. The cattle owners surveyed in the study represent a specialized group among Oklahoma cattle owners. All survey respondents were members of one or more cattle breeder associations. Therefore, the results of the survey may only be valid when referring to members of the specific breeder associations included in the survey, or possibly all members of Oklahoma cattle breeder associations.

Table XXIV. Mean response scores to coyote damage opinion statement by Oklahoma sheep owners and cattle owners responding to survey, 1975.

Respondent category	No. of respondents	Mean score	Standard deviation
Sheep owners			
All survey respondents	106	3.62	1.22
Sheltered lambing facility	77	3.65	1.20
Open/sheltered or open lambing facility	25	3.60	1.32
Cattle owners			
All respondents	149*	2.01	1.30
Open/sheltered or open calving facility	121	2.06	1.24
Sheltered calving facility	24	2.00	1.11

*Descrepancy in total due to incompleted questionnaires.

Questionnaires were returned by ranchers who grazed and/or quartered cattle in 58 (75.3 percent) of the 77 state counties. The January 1, 1975, inventory total (32,449) represented 0.05 percent of all cattle and calves on Oklahoma farms and ranches (6,500,000) (Oklahoma Crop and Livestock Reporting Service 1975) for January 1, 1975.

Losses of survey respondents totalled 1,464 for all causes over all production periods, an average of 9.1 cattle and/or calves lost per respondent. Losses attributed to predators (173) comprised 11.8 percent of the total losses. Disease or poison (447) accounted for 30.5 percent; weather (87) and theft (71) together, made up 10.8 percent; all other known causes (307), 21.0 percent; and all losses due to unknown causes (380) accounted for 26.0 percent of the total losses (Table XXV).

Coyote depredations (83) accounted for 5.7 percent of the total losses reported and 48.0 percent of all losses attributed to predators.

The mean number of cattle and/or calves lost attributed to coyote depredation was 0.52 with a standard deviation of 1.47. One hundred and thirty respondents (81.3 percent) reported no losses to coyotes. Cattle owners who reported losses to coyotes (30, 18.7 percent) averaged 2.77 cattle and/or calves lost to coyote depredation.

Calculation of losses for each production period and percentage of total inventory lost was restricted to cattle owners who reported an inventory total for January 1, 1975. Therefore, the

Table XXV. Total cattle and/or calves lost and percent of total lost by specific loss categories for 1975 as reported by all Oklahoma cattle owners responding to survey.

Loss category	Total losses	Percent of total losses to predators	Percent of total losses
Predation	173		11.8
Coyote	83	48.0	5.7
Dog	80	46.2	5.5
Bobcat	1	0.6	0.07
Unidentified predator	9	5.2	0.6
Disease-poison	447		30.5
Weather	87		5.9
Theft	71		4.8
All other known causes	307		21.0
All unknown causes	380		26.0
Total	1464		100.0

loss figures that follow are lower than those reported earlier in the text.

Total losses to all causes, by production period, are presented in Table XXVI. Fifty percent of the total losses of all cattle and/or calves were pre-weaned calves. "Other" known causes were reported responsible for 27.0 percent of the total 690 pre-weaned calves reported lost. Disease and/or poison accounted for 20.4 percent and all known causes, 23.2 percent of the pre-weaned calf losses. Losses attributed to predators comprised 18.8 percent of the total pre-weaned calves lost.

Pre-weaned calves comprised 80.7 percent of the total losses attributed to predators. Coyote (62) and dog (61) depredations on pre-weaned calves together accounted for 76.4 percent of all predator losses.

Total losses to all causes (1,383) equalled 4.26 percent of the January 1, 1975, total inventory of 32,449. Losses attributed to predation (161) amounted to 0.49 percent of the total inventory. Losses due to disease and/or poison (408) comprised 1.25 percent; weather (79) and theft (63) together, 0.44 percent; all other known causes (301), 0.93 percent; and losses due to all unknown causes (371) comprised 1.14 percent of the total January 1, 1975, inventory (percentages were taken to two decimal places to provide a more accurate extrapolation).

Among the losses due to predators, those attributed to coyotes (76) accounted for 0.23 of the inventory; dogs (75), 0.23 percent; bobcats (1), 0.01 percent; and unknown predators (9), 0.03 percent

Table XXVI. Total cattle and calf losses for 1975 to all causes by production period as reported by Oklahoma cattle owners responding to the survey, 1975.

Loss category	Cattle	Calves		Total
		Before weaning	After weaning	
Predation	23	130	8	161
Coyote	14	62	6	76
Dog	8	61	6	75
Bobcat	0	1	0	1
Unidentified Predator	1	6	2	9
Disease-poison	198	141	69	408
Weather	13	58	8	79
Theft	16	15	32	63
All other known	61	186	54	301
All unknown	149	160	62	371
Total	460	690	233	1383

of the January 1, 1975, inventory total.

By assuming the percentage of inventory losses, as reported in the survey, were representative of all losses to all Oklahoma cattle owners in 1975, total losses and gross income lost to all Oklahoma cattle owners was estimated. The total inventory of 4,057,000 cattle and 2,443,000 calves on all Oklahoma farms and ranches (as estimated by Oklahoma Crop and Livestock Reporting Service 1975) was multiplied by the percentage loss for each category, as reported by survey respondents, to estimate the total number of cattle and/or calves lost for each category and production period.

An estimate of the gross income lost to all Oklahoma cattle owners was calculated by assigning a value of $150.00 per head of cattle, $35.00 per calf (before weaning), and $130.00 per calf (after weaning) lost. These values represent market value estimates obtained from U.S.D.A. price reports and research faculty of the Department of Agricultural Economics, Oklahoma State University.

Using above methods, total losses and gross income lost to all Oklahoma cattle owners in 1975, from all loss categories, over all production periods, equalled 274,083 cattle and/or calves lost and $24,535,400 respectively (Table XXVII).

These totals include 31,835 cattle and/or calves and $1,766,410 of gross income loss attributed to predators; 81,242 cattle and/or calves and $8,679,495 gross income loss due to disease and/or poison; 15,544 cattle and/or calves and $981,850 gross income loss to weather; 12,489 cattle and/or calves and $1,409,130 gross income

Table XXVII. Percent of survey inventory lost and estimated total losses and gross income lost for all Oklahoma cattle owners, by lost category for 1975.

Loss category	Percent of survey inventory lost	Estimated total losses of cattle and/or calves to all Oklahoma cattle owners	Estimated gross income to all Oklahoma cattle owners $
Predation	0.49	31,825	1,766,410
Coyote	0.23	15,258	855,915
Dog	0.23	14,505	817,705
Bobcat	0.003	195	42,790
Unidentified	0.03	1,635	85,205
Disease-poison	1.25	81,242	8,679,495
Weather	0.24	15,544	981,850
Theft	0.19	12,489	1,409,130
All other known	0.93	60,054	4,524,710
All unknown	1.14	74,029	7,175,805
Total	4.26	275,083	24,535,400

loss due to theft; 60,054 cattle and/or calves and $4,522,710 gross income loss to all other known causes; and 74,029 cattle and/or calves and $7,175,805 gross income loss due to all unknown causes.

Within the losses to predators, estimated losses attributed to coyotes totalled 15,258 cattle and/or calves and an estimated gross income loss to all Oklahoma cattle owners of $855,915 in 1975.

Total Losses Attributed to Predators by Type of Calving Facility. Although mean loss values for all predators were higher among respondents reporting open or a combination open and sheltered facilities than among respondents reporting sheltered facilities, only these differences were not statistically significant ($P < 0.05$).

Total Losses Attributed to Coyote Depredation by Geographic Region. The southeast region recorded the highest losses per respondent and percent of total losses attributed to coyote depredation (Table XXVIII). These figures may be biased by four respondents from Johnston county who reported almost 50 percent (47.1 percent) of the losses for the southeast region. The central and northeast regions recorded the next highest losses per respondent (CE 0.59, NE 0.53) and percentage of total losses attributed to coyote depredation (CE 6.5 percent, NE 6.3 percent), respectively.

Response to Coyote Damage Opinion Question. Respondents were asked to rank, on a scale of 1 to 5, with 1 meaning "no damage" and 5 meaning "a lot of damage," the amount of damage the respondent believed that coyotes do to Oklahoma livestock (Table XXIV). Mean

Table XXVIII. Cattle and/or calf losses attributed to coyote depredation by geographic region, Oklahoma, 1975.

Region	No. of respondents	Losses attributed to coyote depredation	Losses per respondent	Percent of total losses
SW	28	8	0.3	4.3
NW	13	3	0.2	3.4
NE	36	19	0.5	6.3
SE	17	17	1.0	8.9
CE	44	26	0.6	6.5

response score, among all cattle owners, was 2.01. Respondents who used a combination open/sheltered or open calving facilities had a mean response of 2.06. Respondents who reported sheltered calving facilities recorded a mean response score of 2.00. The differences in mean scores were not statistically significant ($P < 0.05$).

CHAPTER IV

SUMMARY

This study was designed to examine three different aspects of the socio-economic impact of the coyote in Oklahoma: (1) public perception of, and non-consumptive recreational preference for the coyote; (2) the coyote's role as a sport animal; and (3) the amount of livestock (sheep and cattle) damage that is attributed to coyote depredation.

All interactions between the three study objectives should be considered to gain a more comprehensive measure of the socio-economic impact of the coyote in Oklahoma. For the purposes of the present study, however, each objective was considered independently of the others. Hopefully, this approach provided a clearer and more precise picture of the benefits and costs accrued to man within each of the study objectives.

Public Perception of, and Non-Consumptive Recreational Preference For the Coyote

This objective involved an exploratory attempt to apply a sociological-psychological research tool (semantic differential) to measure public perception of the coyote relative to eight other wildlife species. This objective also considers public recreational preference for the coyote relative to the same eight species and a measure of public opinion regarding increased attention and specialized

funding for nongame wildlife.

Among all respondents to the coyote was perceived and preferred least positively among the nine species included in the survey.

Individual groups or survey stratifications did not differ markedly in their perception of or preference for the coyote. All study stratifications perceived and preferred the coyote less positive than the eight other species.

No statistically significant differences ($P < 0.05$) in perception of or preference for the coyote were noted between such groups as livestock owners--all other respondents; rural-urban respondents; etc. The possibility exists that modification of the Semantic Differential technique, as used in the present study, may have reduced the sensitivity of the technique to a point where it was unable to detect actual differences in perception or preference that may exist among the survey respondents.

Assuming that no significant differences in perception or preference for the nine wildlife species exist, the survey results suggest that Oklahomans may exhibit a relatively homogenous or non-selective perception of, and recreational preference for the wildlife resource in general.

Individuals who reported high levels of participation (29 or more days) in both consumptive (hunting and/or fishing) and non-consumptive (outdoor recreation other than hunting or fishing) outdoor recreation, perceived and preferred the coyote more positively than any of the other study stratifications.

All survey respondents exhibited positive agreement with both

nongame opinion statements. Respondents felt that non-game wildlife should receive more attention from public and private conservation organizations than they now receive. Survey respondents also supported a (to a slightly lesser degree) proposed voluntary public contribution program for the conservation and management of non-game wildlife.

The trend among respondents to score the coyote neutral or slightly negatively over word pair harmful-beneficial can be misleading when attempting to extrapolate these results to public opinion regarding the coyote-livestock controversy. Mean response scores along with the high percentage of individuals who responded neutrally over the harmful-beneficial word scale could lead one to conclude that the general public retains a "wait and see" attitude and has not yet taken sides in the controversy. But an examination of the distribution of survey response to coyote: harmful-beneficial suggests another conclusion. The tri-modal response curve suggests that a portion of the general public remains somewhat polarized on the question of whether coyotes pose a serious enough problem for domestic livestock owners to warrant extensive predator control programs.

Without previous studies of perception of, and preference for wildlife in Oklahoma to compare the present study with, it is impossible to quantify changes in public attitudes towards the coyote or any of the other survey species. Hopefully, the present study can be used as a yardstick by which future perception/preference studies can be compared to asses changes to public attitudes toward particular wildlife species or the wildlife resource in general.

The Coyote As A Sport Animal

Members of 10 Oklahoma fox and wolf hunting clubs were surveyed in an attempt to estimate the amount of time and money these hunters spent while pursuing their sport in 1975. The results allow a number of generalizations to be made about the members of Oklahoma fox and wolf hunting clubs that responded to the survey. In 1975, the average respondent:

- had been hunting coyotes for 30 years.
- was a member of 2 to 3 coyote hunting clubs.
- attended 3 field trials.
- hunted 86.5 days.
- drove about 4,626 miles while hunting coyotes.
- hunted with trail hounds and no other weapon.
- owned approximately 10 hunting dogs.
- typically hunted with a group during the spring, fall, and winter.
- harvested about 17 coyotes.
- spent $2516.46 on coyote hunting expenses ($145.46 per coyote harvested and $29.09 per hunting day.)
- after coyotes, also preferred hunting quail, squirrel, deer, bobcat, and rabbit (in that order) in addition to a number of other species.
- felt that the coyote was responsible for a minimal amount of damage to domestic livestock in Oklahoma.

Hunters contacted after the survey was completed expressed concern that the financial and time investments are keeping a number of younger hunters from participating in the sport. Some hunters also felt that the lack of "young blood" would not allow the sport to

continue at its present high intensity.

Results of this survey support a contention that has been held by sport hunters of coyotes for a long time; the coyote can, and does supply a substantial amount of consumptive recreation for the sport hunter in Oklahoma. The amount of time and money that members of Oklahoma fox and wolf hunting clubs spent while hunting coyotes in 1975 should rank the coyote as the most important predatory game species in Oklahoma.

Although no data were collected regarding respondents' ages, the high average number of years hunting and personal observations at field trials suggests a relatively old age distribution among sport hunters. This old age structure among "houndmen" is probably related to the high cost and amount of time required to successfully pursue the sport.

Livestock Damage Attributed to Coyote Depredation

A number of Oklahoma sheep and cattle owners were surveyed in an attempt to estimate the statewide losses, percent of survey inventory lost, and gross income loss attributed to coyote depredation on domestic livestock in Oklahoma in 1975. Estimated total losses of sheep and/or lambs attributed to coyote depredation totalled 2,270 or 2.55 percent of the total state inventory of 89,000 sheep and lambs on January 1, 1975. Gross income loss attributed to coyote depredation on sheep and/or lambs in Oklahoma was an estimated $60,155.

Estimated gross income loss due to all other known causes totalled $88,218. All unknown causes accounted for $71,471 in gross income lost to all Oklahoma sheep owners in 1975.

Significantly lower sheep and/or lamb losses to predators (coyote, dog, bobcat, and unidentified predator) were reported by sheep owners who practiced improved lambing techniques (eg. sheltered lambing facilities) than losses to predators reported by sheep owners who used open or a combination open and sheltered facility.

As a higher percentage of federal predator control funds are expended in response to higher losses to predators reported by sheep owners who utilize less-than-optimal lambing facilities (eg. open or open/sheltered), there is a danger that the federal government may be subsidizing poor management practices on the part of some livestock owners in Oklahoma.

Estimated statewide cattle and/or calf losses attributed to coyote depredation totalled 15,258. This amounted to 0.23 percent of the total state inventory of 6.5 million cattle and calves on January 1, 1975. Gross income loss attributed to coyote predation on cattle and/or calves in Oklahoma was an estimated $891,915. The majority of coyote depredations (81.6 percent) were reported on pre-weaned calves. Estimated gross income losses to disease and/or poison totalled $8,769,495 to Oklahoma cattle owners in 1975. All other known causes (non-predator) accounted for $6,913,690; and all unknown causes, $7,175,805 in gross income lost to the Oklahoma cattle owner.

No significant differences in reported losses to predators were noted between cattle owners who used an open or combination open and sheltered calving facility and respondents who utilized a

sheltered facility only.

Cattle and sheep owners differed significantly in the amount of damage to Oklahoma livestock that each group felt the coyote inflicted. Sheep owners felt the coyote was responsible for a significantly higher amount of damage to all Oklahoma livestock than did cattle owners.

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APPENDIX A

COVER LETTERS AND QUESTIONNAIRE:

OBJECTIVE A

Below are nine photographs of different animals. Under each photo are some word scales. At the ends of each scale are two words that might be used to describe that animal. The words are meant to be exact opposites of each other.

Look at each animal and then mark the position on <u>each</u> of the word scales that <u>most nearly</u> describes how you feel about that animal.

FOR EXAMPLE:

If you feel that the animal is <u>very closely</u> related to one end of the scale you might place your check like this:

GOOD ___X___ _____ _____ _____ _____ BAD

If you feel that the animal is <u>quite closely</u> related to one end of the scale you might mark this position:

GOOD _____ _____ _____ ___X___ _____ BAD

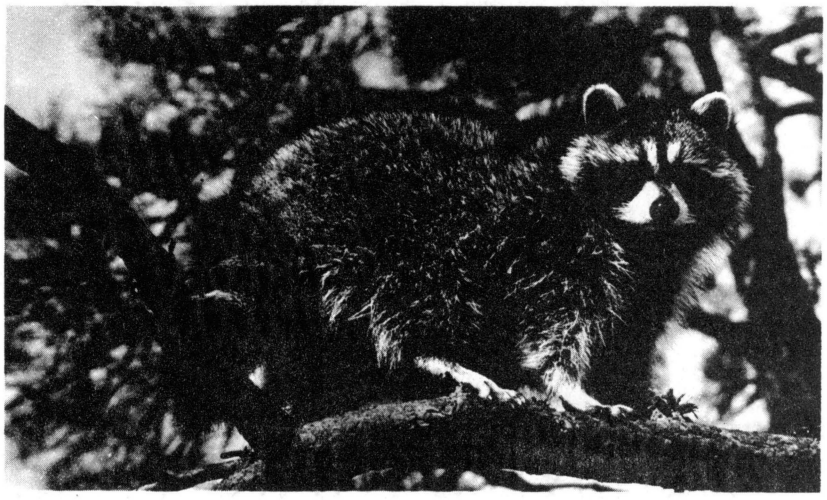
If you feel that the animal is <u>equally associated</u> with both ends of the word scale you would mark the middle or neutral position on the scale:

GOOD _____ _____ ___X___ _____ _____ BAD

PLEASE DON'T SPEND A LOT OF TIME ON ANY ONE ITEM. MARK ONLY YOUR FIRST IMPRESSION.

* * *

RACCOON



UGLY _____ _____ _____ _____ _____ BEAUTIFUL

FASCINATING _____ _____ _____ _____ _____ BORING

VALUABLE _____ _____ _____ _____ _____ WORTHLESS

REPULSIVE _____ _____ _____ _____ _____ ATTRACTIVE

BENEFICIAL _____ _____ _____ _____ _____ HARMFUL

DULL _____ _____ _____ _____ _____ EXCITING

BOBCAT

UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
FASCINATING	_____	_____	_____	_____	_____	BORING
VALUABLE	_____	_____	_____	_____	_____	WORTHLESS
REPULSIVE	_____	_____	_____	_____	_____	ATTRACTIVE
BENEFICIAL	_____	_____	_____	_____	_____	HARMFUL
DULL	_____	_____	_____	_____	_____	EXCITING

MOURNING DOVE

UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
FASCINATING	_____	_____	_____	_____	_____	BORING
VALUABLE	_____	_____	_____	_____	_____	WORTHLESS
REPULSIVE	_____	_____	_____	_____	_____	ATTRACTIVE
BENEFICIAL	_____	_____	_____	_____	_____	HARMFUL
DULL	_____	_____	_____	_____	_____	EXCITING

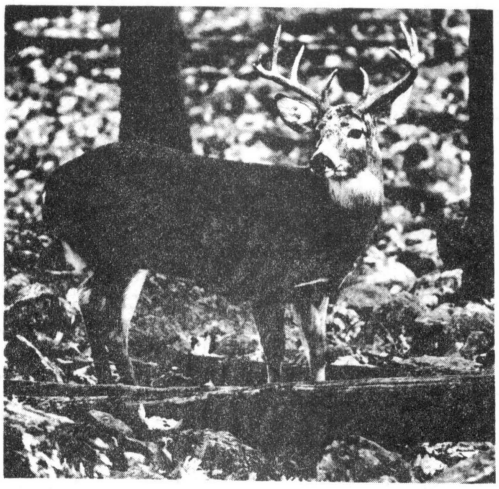
COYOTE

UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
FASCINATING	_____	_____	_____	_____	_____	BORING
VALUABLE	_____	_____	_____	_____	_____	WORTHLESS
REPULSIVE	_____	_____	_____	_____	_____	ATTRACTIVE
BENEFICIAL	_____	_____	_____	_____	_____	HARMFUL
DULL	_____	_____	_____	_____	_____	EXCITING

SQUIRREL

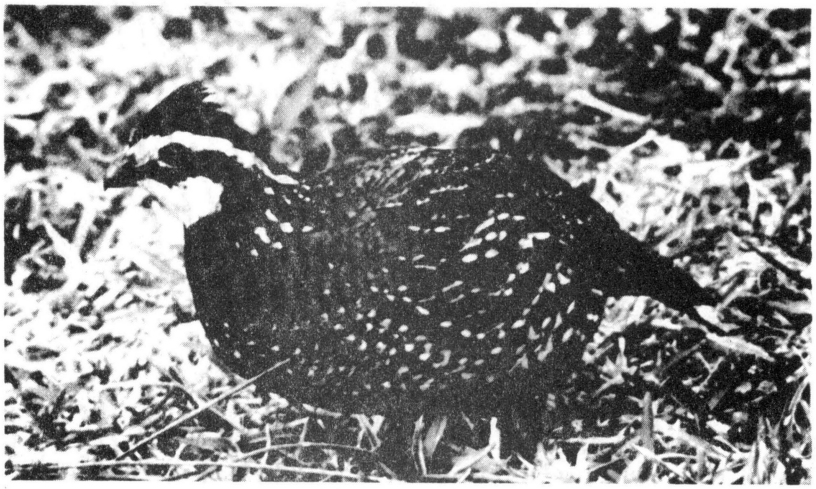
UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
FASCINATING	_____	_____	_____	_____	_____	BORING
VALUABLE	_____	_____	_____	_____	_____	WORTHLESS
REPULSIVE	_____	_____	_____	_____	_____	ATTRACTIVE
BENEFICIAL	_____	_____	_____	_____	_____	HARMFUL
DULL	_____	_____	_____	_____	_____	EXCITING

WHITE-TAILED DEER



UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
FASCINATING	_____	_____	_____	_____	_____	BORING
VALUABLE	_____	_____	_____	_____	_____	WORTHLESS
REPULSIVE	_____	_____	_____	_____	_____	ATTRACTIVE
BENEFICIAL	_____	_____	_____	_____	_____	HARMFUL
DULL	_____	_____	_____	_____	_____	EXCITING

BOBWHITE QUAIL

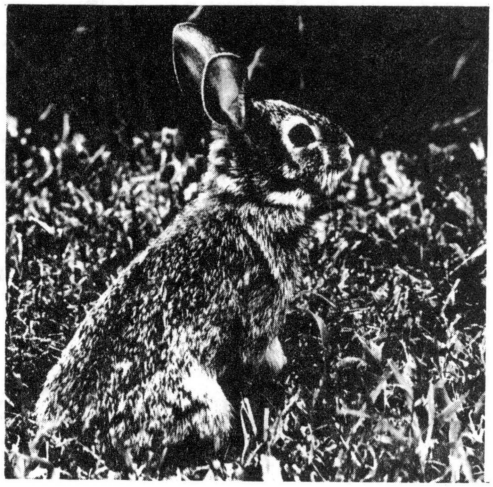


UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
FASCINATING	_____	_____	_____	_____	_____	BORING
VALUABLE	_____	_____	_____	_____	_____	WORTHLESS
REPULSIVE	_____	_____	_____	_____	_____	ATTRACTIVE
BENEFICIAL	_____	_____	_____	_____	_____	HARMFUL
DULL	_____	_____	_____	_____	_____	EXCITING

RED-TAILED HAWK

UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
FASCINATING	_____	_____	_____	_____	_____	BORING
VALUABLE	_____	_____	_____	_____	_____	WORTHLESS
REPULSIVE	_____	_____	_____	_____	_____	ATTRACTIVE
BENEFICIAL	_____	_____	_____	_____	_____	HARMFUL
DULL	_____	_____	_____	_____	_____	EXCITING

COTTONTAIL RABBIT



UGLY	_____	_____	_____	_____	_____	BEAUTIFUL
FASCINATING	_____	_____	_____	_____	_____	BORING
VALUABLE	_____	_____	_____	_____	_____	WORTHLESS
REPULSIVE	_____	_____	_____	_____	_____	ATTRACTIVE
BENEFICIAL	_____	_____	_____	_____	_____	HARMFUL
DULL	_____	_____	_____	_____	_____	EXCITING

In the following statements, mark the one choice that most nearly describes your feelings.

1. Hunters and fishermen now pay for most of the wildlife management programs through license sales and various taxes. I favor a system where an individual could contribute money to go toward the conservation and management of non-game animals (animals that are not hunted).

_____Strongly Agree _____Strongly Disagree

_____Agree _____Not Sure _____Disagree

2. Non-game animals should receive more attention from public and private conservation organizations than they now get.

_____Strongly Agree _____Strongly Disagree

_____Agree _____Not Sure _____Disagree

****

The following information is very important. Please mark the one answer that most nearly describes you.

4. Do you own any livestock? _____Yes _____No 5. Sex: ___Male ___Female

6. In what town or city do you live? _____

7. About how many days do you spend hunting and/or fishing in one year?

_____None _____1 - 14 Days _____15 - 28 Days _____29 or more

8. About how many days do you spend taking part in outdoor activities other than hunting or fishing in one year? (things like hiking, nature photography, bird-watching, pleasure boating, etc.)

_____None _____1 - 14 Days _____15 - 28 Days _____29 or more

****

9. Please rank the following animals in the order that you would most like to see or hear when on a walk or a drive (Rank them as 1 = most desirable, 2 = next, and so on down to 9 = least desirable).

_____RACCOON
_____BOBCAT
_____DOVE
_____WHITE-TAILED DEER
_____BOBWHITE QUAIL
_____COYOTE
_____SQUIRREL
_____RED-TAILED HAWK
_____COTTONTAIL RABBIT

10. Please add any comments below.

THANK YOU VERY MUCH!!!!

Oklahoma State University

SCHOOL OF BIOLOGICAL SCIENCES

STILLWATER, OKLAHOMA, 74074
(405) 624-5555

Dear Oklahoman:

More leisure time and an increased concern for the environment have resulted in more and more people taking part in outdoor activities, especially wildlife-related recreation. These activities range from hunting and fishing to birdwatching and nature photography.

As public and private wildlife organizations expand their programs to improve these recreational activities, they need information on public preferences for different types of wildlife. This study is designed to provide some of this information.

Your help in this survey will enable us to determine the recreational importance of some Oklahoma birds and mammals.

Please take a few minutes to complete the enclosed survey form, then place it in the self-addressed envelope and drop it in the mail. Postage has already been paid.

All information will be kept strictly confidential. Your signature is not required on the survey form.

Thank you for your time and assistance.

Sincerely,

Joseph A. Mincolla
Research Assistant

JM:ad
enclosure

Oklahoma State University

SCHOOL OF BIOLOGICAL SCIENCES

STILLWATER, OKLAHOMA, 74074
(405) 624-5555

Dear Oklahoman:

Recently I sent you a survey form regarding the recreational importance of some Oklahoma birds and mammals, and requested that you fill it out and return it to me. I have not received your form at this time - perhaps because you misplaced it or haven't had time to fill it out.

I am sending you another questionnaire which I hope you will have time to fill out as soon as possible. If you have already returned a questionnaire, please destroy this one.

The information that we are gathering from people all across the state will be of great value to organizations that are attempting to improve outdoor recreation for all Oklahomans.

Please take a few minutes to complete the enclosed form, then place it in the self-addressed envelope and drop it in the mail. Postage has already been paid.

Please remember to mark your response for all six of the word pairs below each photo. The survey is of little value if you only respond to one or two word pairs for each photo.

Thank you once again for your help.

Sincerely,

Joseph A. Mincolla
Research Assistant

JAM/ad
enclosure

APPENDIX B

COVER LETTER AND QUESTIONNAIRE:

OBJECTIVE B

1975 COYOTE HUNTER QUESTIONNAIRE

The term "last year" refers to the period between January 1, 1975 through December 31, 1975.

1. How many years have you been hunting coyotes? _____

2. Last year, how many days did you spend hunting only coyotes?_____

3. Last year, about how many miles did you drive while hunting only coyotes?_____

4. While hunting only coyotes last year:

   a. What method or methods did you use to hunt coyotes? (check one or more)

   _____Trail Hounds _____Tracking by yourself

   _____Sight Hounds _____Flushing with vehicle

   _____Calling and shooting _____Other (write in below)

   _____

   b. What type of weapon did you use?

   _____None _____Handgun _____Bow

   _____Rifle _____Shotgun

   c. Did you hunt _____alone? _____with a group not in Field trials (check one or more)

   _____with a group in Field trials

   d. In what county did you do most of your hunting?_____

   e. When did you do most of your hunting? __Summer ___Fall __Spring ___Winter

   f. How many coyotes did you harvest last year?_____

   g. In what county did you harvest most of them?_____

5. How many coyote hunting dogs did you have at the end of last year?_____

   a. Of this total how many: _____Trail Hounds _____Other
   _____Sight Hounds

6. Did you operate a hunting area (rent house, dog pens, etc.) away from home? _____yes ____no

7. If you did how many days did you spend there last year?_____

8. Do you own a car, truck, motorcycle, or other vehicle that you use just for coyote hunting? _____yes _____no

9. Do you own a trailer than you use just for coyote hunting?
   _____yes _____no

10. Please estimate what your coyote hunting expenses were for last year in each category:

a. Purchasing Dogs	$_____	g. Cost of Hunting area (purchase, rent, upkeep, supplies, etc.)	$_____
b. Food for Dogs	$_____		
c. Medical Bills for Dogs	$_____	h. Gasoline & Vehicle Maintenance	$_____
d. Other Dog Supplies	$_____	i. C.B. Radio	$_____
e. Purchasing a vehicle for coyote hunting (trailer also)	$_____	j. Field Trial Entrance Fees	$_____
f. Guns & Shells	$_____	k. All other expenses (food, clothing, etc)	$_____

11. Are you a member of one or more Oklahoma coyote hunting associations? _____yes _____no lla. If yes, how many?_____

12. If yes, how many days did you spend with other club members last year in:

    a. Coyote Hunting (not Field Trials)_____

    b. Field Trials _____

    c. Non-hunting Club activity _____

13. How many field trials did you attend last year?_____

14. Did you purchase a vehicle or trailer last year that you use for coyote hunting? _____yes _____no

    a. If yes, how much did you purchase it for?_____

    b. Did you use less than ½

       about ½ (Circle one)

       more than ½ of the time for coyote hunting?

15. Do you think that coyote sport hunting is decreasing, increasing, or about the same from year to year? (Circle one)

16. Last year, did you help any ranchers or farmers who had a problem with coyotes? _____yes _____no

    a. If yes, did you _____advise the farmer or rancher how to kill the coyotes?

       (Check one) _____Help him kill the coyotes?

       _____Kill the coyotes for him?

17. Please rank the following animals in the order that you most enjoy hunting them. Only rank the animals that you have hunted on a fairly regular basis. (1 - most enjoyable, 2 - next, and so on)

_____Quail	_____Bobcat	_____Turkey
_____Ducks & Geese	_____Rabbit	_____Woodcock or Snipe
_____Pheasant	_____Coyote	_____Prairie Chicken
_____Deer	_____Squirrel	_____Dove

18. Would you like to have the coyote placed on the list of game animals in Oklahoma if they could be run for sport year around?

_____yes _____no

19. On a scale of 1 to 5, with 1 meaning no damage and 5 meaning a lot of damage, how much damage do you think the coyote does to Oklahoma livestock?

1 2 3 4 5 (Circle one)

20. Please add any comments below.

21. When you have finished, just fold the questionnaire, place it in the pre-addressed envelope and drop it in the mail. No postage stamp is necessary. Postage has been paid.

THANK YOU!!!

Oklahoma State University

SCHOOL OF BIOLOGICAL SCIENCES

STILLWATER, OKLAHOMA, 74074
(405) 624-5555

Dear Coyote Sport Hunter:

With the help of Earl Jones, J.G. McClure, and legislative representative Virgil Wallgreen of the Oklahoma State Fox and Wolf Hunters' Association, I am conducting a survey of all Oklahoma coyote sport hunters. The aim of the survey, which is completely confidential, is to find out how much time and money is spent by the coyote hunter on his sport.

After talking with me about the survey, Mr. McClure provided me with the membership lists of most of the hunting clubs affiliated with the Oklahoma State Association.

Now I need your help to gather this information. Please take a few minutes, right now if possible, and fill out the enclosed form.

When you finish, just put the form in the pre-addressed envelope and drop it in the mail. No postage stamp is needed. Postage has already been paid.

We hope that the results of the survey will help your local and state-wide organization improve the sport of coyote hunting.

I have attended the Cimmarron Valley bench show-field trial and may have already talked with you. If not, I will be attending many more trials this year and would be happy to meet with you.

Thank you for your time and effort to help me.

Joe Mincolla
Oklahoma State University

Enclosures

P.S. If you have any immediate questions concerning the survey, please contact J.G. McClure or Virgil Wallgreen.

Oklahoma State University

SCHOOL OF BIOLOGICAL SCIENCES

STILLWATER, OKLAHOMA, 74074
(405) 624-5555

Dear Coyote Sport Hunter:

Recently I sent you a coyote hunter questionnaire and asked that you fill it out and return it to me. I have not received your form at this time - perhaps because you have misplaced it or haven't had time to fill it out.

I am sending another questionnaire which I hope you will have time to fill out as soon as possible. If you have already returned a questionnaire, please destroy this one.

The information you and other coyote hunters supply me with will be of great value to the future of coyote sport hunting.

Please fill out the form and return it to me at your earliest convenience.

Remember that no postage is required. Just send it back to me in the pre-addressed envelope.

Thank you very much for your cooperation.

Sincerely,

Joe Mincolla
Oklahoma State University

JM/ac

APPENDIX C

COVER LETTERS AND QUESTIONNAIRE:

OBJECTIVE C

Oklahoma State University

SCHOOL OF BIOLOGICAL SCIENCES

STILLWATER, OKLAHOMA, 74074
(405) 624-5555

Dear Oklahoman:

With the help of you and the U.S. Dept. of Agriculture we are trying to measure the livestock losses to the Oklahoma rancher in 1975. We would greatly appreciate it if you took a few minutes to complete the brief form below. All information will be kept strictly confidential. When you complete the form just place this entire sheet in the pre-addressed envelope and drop it in the mail. Postage has already been paid. Thank you very much for your help.

Sincerely,

Joe Mincolla,
Research Assistant

* *

1. INVENTORY

	Jan. 1, 1975	Jan. 1, 1976
Total Herd (Cattle and Calves)	______	______

2. LOSSES

		Number lost or Died	
	CATTLE	CALVES	
		Before Weaning	After Weaning
ALL UNKNOWN CAUSES	______	______	______
KNOWN CAUSES			
Disease-Poison	______	______	______
Weather	______	______	______
Dog	______	______	______
Coyote	______	______	______
Bobcat	______	______	______
Unknown predator	______	______	______
Theft	______	______	______
Other Known Causes	______	______	______

3. What type of area was used for the cow-calf operation in 1975?

Open________ Sheltered ________

4. On a scale of 1 to 5, with one meaning no damage and five meaning a lot of damage, how much damage do you think the coyote does to Oklahoma livestock? (Circle one number)

1 2 3 4 5

5. In which county do you keep your livestock? ________________

* *

THANK YOU for your Help!!!

If you have any additional comments please use the back of this page.

Oklahoma State University

SCHOOL OF BIOLOGICAL SCIENCES

STILLWATER, OKLAHOMA, 74074
(405) 624-5555

Dear Oklahoman:

Recently I sent you a questionnaire regarding your livestock losses for 1975. I haven't received your form yet - possibly you have misplaced it or haven't had time to fill it out.

I am sending another questionnaire and hope you will have a few minutes to complete it. Remember, all information will be kept strictly confidential. When you complete the form just place this entire sheet in the pre-addressed envelope and drop it in the mail. Postage has already been paid. Thank you very much for your help.

Sincerely,

Joe Mincolla,
Research Assistant

* *

1. INVENTORY — Jan. 1, 1975 — Jan. 1, 1975

   Total Herd (Cattle and Calves) ____________ ____________

2. LOSSES

		Number Lost or Died	
	CATTLE	CALVES Before Weaning	CALVES After Weaning
ALL UNKNOWN	______	______	______
KNOWN CAUSES			
Disease-Poison	______	______	______
Weather	______	______	______
Dog	______	______	______
Coyote	______	______	______
Bobcat	______	______	______
Unknown Predator	______	______	______
Other Known Causes	______	______	______

3. What type of area was used for the cow-calf operation in 1975?

   Open ____________ Sheltered ____________

4. On a scale of 1 to 5, with one meaning to damage and five meaning a lot of damage, how much damage do you think the coyote does to Oklahoma livestock? (Circle one number)

   1 2 3 4 5

5. In which county do you keep your livestock? ______________________________

* *

THANK YOU for all your help!!!

If you have any additional comments please use the back of this page.

Oklahoma State University

SCHOOL OF BIOLOGICAL SCIENCES

STILLWATER, OKLAHOMA, 74074
(405) 624-5555

Dear Oklahoman:

Recently I sent you a questionnaire regarding your livestock losses for 1975. I haven't received your form yet - possibly you have misplaced it or haven't had time to fill it out.

I am sending another questionnaire and hope you will have a few minutes to complete it. Remember, all information will be kept strictly confidential. When you complete the form just place this entire sheep in the pre-addressed envelope and drop it in the mail. Postage has already been paid. Thank you very much for your help.

Sincerely,

Joe Mincolla,
Research Assistant

* *

1. INVENTORY

	Jan. 1, 1975	Jan. 1, 1976
All Lamb and Sheep	______	______

2. LOSSES

	SHEEP	Number Lost or Died — LAMB Before Docking	LAMB After Docking
ALL UNKNOWN CAUSES	______	______	______
KNOWN CAUSES			
Disease - Poison	______	______	______
Weather	______	______	______
Dog	______	______	______
Coyote	______	______	______
Bobcat	______	______	______
Unknown Predator	______	______	______
Theft	______	______	______
Other Known Causes	______	______	______

3. What type of area was used for the sheep-lamb operation in 1975?

Open ______ Sheltered ______

4. On a scale of 1 to 5, with one meaning no damage and five meaning a lot of damage, how much damage do you think the coyote does to Oklahoma livestock? (Circle one number)

1 2 3 4 5

5. In which county do you keep your livestock? ______________________

* *

THANK YOU for your Help!!!

If you have any additional comments please use the back of this page.

Oklahoma State University

SCHOOL OF BIOLOGICAL SCIENCES

STILLWATER, OKLAHOMA, 74074
(405) 624-5555

Dear Oklahoman:

With the help of you and the U.S. Dept. of Agriculture we are trying to measure the livestock losses to the Oklahoma sheepgrower in 1975. We would greatly appreciate it if you took a few minutes to complete the brief form below. All information will be kept strictly confidential. When you complete the form just place this entire sheet in the pre-addressed envelope and drop it in the mail. Postage has already been paid. Thank you very much for your help.

Sincerely,

Joe Mincolla,
Research Assistant

* *

1. INVENTORY

	Jan. 1, 1975	Jan. 1, 1976
All Lamb and Sheep	_____	_____

2. LOSSES

	Number Lost or Died		
	SHEEP	LAMB	
		Before Docking	After Docking
ALL UNKNOWN CAUSES	_____	_____	_____
KNOWN CAUSES			
Disease - Poison	_____	_____	_____
Weather	_____	_____	_____
Dog	_____	_____	_____
Coyote	_____	_____	_____
Bobcat	_____	_____	_____
Unknown Predator	_____	_____	_____
Theft	_____	_____	_____
Other Known Causes	_____	_____	_____

3. What type of area was used for the sheep-lamb operation in 1975?

Open _____ Sheltered _____

4. On a scale of 1 to 5, with one meaning no damage and five meaning a lot of damage, how much damage do you think the coyote does to Oklahoma livestock? (Circle one number)

1 2 3 4 5

5. In which county do you keep your livestock? _____

* *

THANK YOU for your Help!!!

If you have any additional comments please use the back of this page.

VITA[2]

Joseph Anthony Mincolla

Candidate for the Degree of

Master of Science

Thesis: THE SOCIO-ECONOMIC IMPACT OF THE COYOTE IN OKLAHOMA

Major Field: Wildlife Ecology

Biographical:

Personal Data: Born in Syracuse, New York, 2 July 1947, the son of Mr. and Mrs. Charles R. Mincolla.

Education: Graduated from St. Elizabeth High School, Oakland, California, in June 1965; attended University of Oklahoma 1970-1972; completed requirements for the Bachelor of Science Degree in Zoology at Oklahoma State University in June 1974; Received Master of Science Degree in Wildlife Ecology at Oklahoma State University in July 1977.

Professional Experience: Research Technician, Oklahoma Cooperative Fishery Unit, June-August 1974, May-August 1975, September-November 1976; Research Technician, Techrod, Inc. (Environmental Impact Study), June 1974-January 1976; Graduate Teaching Assistant, Oklahoma State University, August 1974 - December 1976; Conservation Intern, National Wildlife Federation, Washington, D.C. June-August 1976.

Honorary and Professional Societies: The Wildlife Society; National Wildlife Federation; Oklahoma Wildlife Federation.