WILDLIFE HABITAT ON PRIVATE LANDS: OKLAHOMA CONSERVATION DISTRICT COOPERATOR ATTITUDES, PERCEPTIONS AND PREFERENCES

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What next?...

"A man takes on a new degree of scholarship when he learns to read as well in the woods as he does in his study."

-Emerson

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CHAPTER I

INTRODUCTION

In 1947 Aldo Leopold wrote,

> Everyone ought to be dissatisfied with the slow progress of conservation to the land. Our 'progress' still consists largely of letterhead pieties and convention oratory. The only progress that counts is that on the actual landscape of the back forty, and here we are still slipping two steps backward for each stride forward. (p. 46.)

When examining the issues surrounding habitat on private lands, this statement appears to contain a grain of truth some 38 years later. Farris and Cole (1981) cited changing land use and agricultural practices as the major reason for the decline in farm wildlife populations throughout the midwest. Wildlife habitat degradation occurs at an increasing rate while progress in conservation is still slow. Leopold's "back forty" has become the "back 320" in today's agricultural scene. Through the years others have noted the need for private lands management for wildlife habitat. Berryman (1957, 1958) called attention to the need for wildlife management on private lands. Another perspective on the seriousness of the problem for wildlife was summarized by Harmon (1981, pg. 378) when he stated, "free wildlife is synonymous with no wildlife on economically

productive cropland."

There are several reasons why wildlife and the habitat which produces and sustains it are in trouble. Historically changing land use patterns have had an impact on habitat. Many of the current trends seen on private agricultural lands today tend to be more detrimental to wildlife than the agricultural operations found on the family farm three or four decades ago. A major shift from diversified farms, with good interspersion of a variety of vegetative cover types, to more simplified agricultural landscapes dominated by one or two row crops (Farris and Cole, 1981) has reduced the number and diversity of wildlife species found on farm lands.

Viewed in the economist's terms, the "common property resource" characteristics of wildlife in the United States creates many difficulties. Miranowski and Bender (1982) summarized the problem when they stated,

> the problem underlying all policy relating to wildlife...and its habitat is the conflict between private and public interests. This conflict is most readily seen on agricultural lands where wildlife habitat is subject to private land-ownership while wildlife itself is collectively, or publicly owned. The inability of private landowners to capture all the benefits associated with wildlife on their lands...leads to the implementation of agricultural practices without significant regard to their effects on wild-life.... (pg. 21)

While the product is common property the habitat which produces it is privately owned. The landowner receives few signals from the marketplace telling him how much wildlife

to produce. This market failure leads to conversion of habitat to other uses which fare well in the marketplace. Wildlife has many diverse values, yet because it is a common property resource it fails to compete well on the open market. The problem continues with the fact that the government entities which have responsibility for and control over wildlife have little or no control over the privately owned habitat necessary to sustain wildlife populations.

Consumptive users, hunters, trappers, and fishermen have been the traditional funding sources for many state wildlife agencies. This means that many agency programs for private lands have required that public access be a major program component. At times wildlife habitat improvement and public access have been viewed as inseparable by wildlife agencies. Funding sources make it difficult for wildlife agencies to separate them. Yet, if we are to be successful in promoting wildlife habitat and in respecting the well established right of landowners to govern access, access and habitat improvement programs probably should be separated. The access "price tag" discourages many landowners from participating in wildlife habitat management programs (Sheriff et al., 1981; Oklahoma Department of Wildlife Conservation, 1984).

McConnell and Harmon (1976) stated that no activity has had more effect on wildlife and habitat than agriculture. Many types of land use are found on private lands. However,

the major portion which does or could hold promise for wildlife habitat is in some type of agricultural use. In Oklahoma, food crops, livestock, cotton, and forestry production are but a few of the land uses with which wildlife habitat must be compatible or competitive.

Wildlife has almost always been considered a byproduct on agricultural lands. The status of wildlife on the farm has been closely tied to agricultural economics and the intensity of land use. In the past when farming took place on a smaller scale with greater on-farm diversity wildlife faired relatively well. Today wildlife habitat on private land must be given some conscious level of priority if it is to exist. Agricultural landowners have production goals and the bottom line is profit with maintenance of the land resource base through time. In most cases wildlife cannot compete with agricultural goods in the marketplace.

This situation leads to a broad spectrum of problems and options for those who work with private landowners. On one end of the spectrum are members of the wildlife community who overlook the primary goals of the landowner. Landowners may be expected to make a considerable sacrifice to provide wildlife habitat and/or access to wildlife. On the opposite end of the spectrum is the agricultural planner who sees a piece of land which is unfit for production of agricultural goods and begrudgingly labels it wildlife land. The Soil Conservation Service land capability classification system has inadvertently helped foster this philosophy.

According to Teels (1983), Class VII lands have become traditionally associated with the idea of wildlife habitat in agricultural land use planning. Within this divergence of opinion is some middle ground which has great potential for benefiting wildlife habitat. Wildlife habitat as a secondary land use on all classes of land offers a great deal of potential for habitat improvement (Teels, 1983). Planners who utilize wildlife compatible conservation practices can promote wildlife as a secondary land use on all land.

Central to realizing the potential of agricultural lands for wildlife habitat is an understanding of the attitudes, preconceptions, and preferences of the private landowner relative to wildlife habitat on his or her land. This study addresses the expressed attitudes, perceptions, and preferences of selected Oklahoma conservation district cooperators. This study involves a survey of two groups of Oklahoma conservation district cooperators. A sample of conservation district cooperators were surveyed as well as a sample of conservation district cooperators who also serve on local conservation district boards.

Significance of the Study

Applegate (1981) said it is the decisions and actions of individuals exercising private ownership rights which control the status of wildlife habitat on private lands. The importance of this statement relative to Oklahoma comes to focus when we consider that 95 percent of the land in

Oklahoma is in private ownership. According to Porter (1984), private landowners may be the most important wildlife managers in Oklahoma today. The private landowner is the key individual in the effort to provide habitat on private lands.

Of the 95 percent of Oklahoma which is is privately owned, 75 percent is under conservation plan through a local conservation district. These landowners are involved in a network which provides them information and technical assistance through local conservation districts in cooperation with the United States Department of Agriculture Soil Conservation Service. Horvath (1976) stated,

> ... one cannot quarrel with the beneficial aspects of the district concept of conservation planning. The basic conservation plan is the single biggest opportunity for converting present agricultural land to wildlife habitat since it provides direct access by conservation agencies to landowners through signed agreements. (pg. 505)

The planning assistance and practices available to cooperators for soil conservation are an ideal vehicle for promoting wildlife habitat improvement. The programs carry multiple benefits and consider the landowners primary land use goals. These programs are conducted by agencies which unlike state wildlife agencies have a mandate to provide assistance to private landowners. Perhaps the strongest point these programs have is that they carry no "public access price tag" for landowners.

Klimstra (1982) criticized both wildlife and agriculture professionals about the declining quality of habitat on

agricultural lands. Despite an indictment of the system nationwide by Klimstra, the agriculture and wildlife communities in Oklahoma have taken action. The urgent situation prompted the formation of the Oklahoma Governor's Task Force Committee for Wildlife Habitat Improvement. Through the task force committee the wildlife and agriculture communities have begun to explore the middle ground for realistic solutions to habitat problems on private lands. This study comes at a time when private agricultural lands/habitat management is critical and interest in improvement of the agricultural lands/wildlife habitat situation is relatively high.

The importance of social science research in the wildlife and agriculture fields is increasingly recognized. In the early 1980s a national research and study group was formed to look at the human dimensions of wildlife resource problems. Sociology positions have begun to appear on conservation agency program staffs. Natural resource managers are becoming more aware that at the center of every natural resource problem is a "people problem". The key to solving those natural resource problems is closely tied to understanding the human component of the problem as well as the technological and ecological aspects of the problem. Baseline data on landowner opinions, attitudes, and preferences are very important.

To be successful, programs must give attention to landowner attitudes and preferences in addition to economics

and practices. It is clear the landowner plays a central role in a successful habitat program. Assumptions have been made by agency personnel concerning the landowners views on wildlife. These assumptions vary widely according to the experiences of the individual making the assumptions. Actual data on landowner attitudes and preferences are rare. Unger (1977) pointed out that it is essential to remember that the viewpoints of individual landowners and land managers are central to any progress that is made in conservation on lands under their control. They must be full participants in developing constructive change or they will not accept it. Horvath (1976) noted the access point must be at the local conservation district level. Others (Clearfield, 1984; Dahlgren, 1982) have pointed out the need for research of a social science nature in the area of agriculture and wildlife resources.

Problem Statement

This survey involves landowners who are involved in an existing communication and assistance network. The cooperators who serve as directors are considered opinion leaders and serve to represent the other cooperators in the district.

The purpose of this research is to provide baseline data and information for more effective conservation planning and implementation of more compatible agricultural land/wildlife habitat management strategies based on

landowner preferences.

This study focuses on two groups within the conservation district network. All of the individuals surveyed had conservation district plans written for their land. A portion of those surveyed also serve in a leadership role as a director on the local conservation district board.

According to Birdwell (1982), these individuals exhibit a greater level of concern for conservation on their lands based on their current participation in the cooperator program. This group is also involved in a preexisting network which facilitates dissemination and implementation of an agricultural lands/habitat program promotion a logistical reality. An assistance program designed around the data gathered in this study has the potential of being implemented on 75 percent (United States Department of Agriculture-Soil Conservation Service, 1982) of Oklahoma's agricultural lands through the conservation district network.

Research Objectives

The research objectives of this study were developed following the review of literature, discussion with landowners, and discussion with wildlife and agriculture professionals. The objectives of this study are:

1. Research Objective 1: Using an attitude scale to determine the positive or negative nature of the attitude of district cooperators in the study toward wildlife and wildlife habitat.

2. Research Objective 2: Using a simple model based on

the diversity assumption (Miranowski and Bender, 1982) to determine the potential condition of the district cooperators agricultural properties relative to wildlife habitat.

3. Research Objective 3: To determine how the expressed attitude of district cooperators concerning wildlife/wildlife habitat correlates with the condition of their property reflected by its diversity rating.

4. Research Objective 4: To identify the characteristics of a conservation agency assistance program which influence participation in the program.

5. Research Objective 5: To identify acceptable components for a habitat assistance program for district cooperators in the study.

6. Research Objective 6: To determine the willingness to use each of the 13 soil and wildlife conservation practices for district cooperators in the study.

7. Research Objective 7: To determine if differences exist between Group I and Group II in this study for selected socioeconomic/demographic characteristics.

Assumptions of the Study

The assumptions of the study are as follows:

1. That the Conservation Agriculture and Wildlife Survey is a valid method of assessing the attitudes, opinions, and preferences of the landowners in the study relative to wildlife and wildlife habitat on private lands.

2. That participants responded to the survey instrument honestly.

3. That wildlife on private lands has many positive values.

4. Wildlife managers and farm planners must accept the economic constraints placed on farmers.

5. That a greater diversity of vegetative types in an area provides a more suitable habitat, by supplying varied

cover and food, for certain species and for a greater variety of species. (Miranowski and Bender, 1982)

6. That interspersion of vegetative types contributes to wildlife abundance by providing a well distributed source of quality food and cover. (Miranowski and Bender, 1982)

7. That management practices that decrease food and cover for wildlife will reduce the abilities of that habitat to support wildlife. (Miranowski and Bender, 1982)

Limitations of the Study

The study is limited to the participants from a stratified random sample of two populations: all conservation district cooperators meeting selection criteria and all conservation district cooperators who serve as conservation district directors in the state of Oklahoma. Due to an agreement with the Oklahoma Conservation Commission, no study of nonrespondents was undertaken, so no evaluation of possible nonresponse bias can be offered.

Definitions

Attitude: A relatively enduring organization of interrelated beliefs that describe, evaluate, and advocate action with respect to an object of situation, with each belief having cognitive, affective, and behavioral components.

Conservation: The protection, improvement, and use of natural resources according to principles that will assure

their highest economic or social benefits for man and his environment now and into the future (Soil Conservation Society of America, 1982).

Conservation Agriculture and Wildlife Survey: An instrument designed by the researcher to assess landowner attitudes toward wildlife/wildlife habitat and landowner preferences for practices and programs (Appendix A).

Conservation District: A public organization created under state enabling law as a special purpose district to develop and carry out a program of soil, water, and related resource conservation, use, and development within its boundaries; in the United States usually a subdivision of state government with a local governing body; often called a soil conservation district or a soil and water conservation district (SCSA, 1982).

Conservation Plan: A collection of material containing land user information requested for making decisions regarding the conservation of soil, water, and related plant and animal resources for all or part of an operating unit.

Conservation Practice: A technique or measure used to meet a specific need in planning and carrying out soil and water conservation programs for which standards and specifications have been developed.

District Cooperator: A landowner who has a signed agreement sheet on file with a local conservation district.

Diversity Assumption: The assumption that: a greater diversity of vegetative types in an area provides a more

suitable habitat, by supplying varied cover and food, for certain species and for a greater variety of species; interspersion of vegetative types contributes to wildlife abundance by providing a well distributed source of quality food and cover; and management practices that decrease food and cover for wildlife will reduce the abilities of that habitat to produce wildlife (Miranowski and Bender, 1982).

Diversity Rating: The sum of the weighted scores from survey questions 1 through 6 and column 1, question 17 in the Conservation Agriculture and Wildlife Survey.

Group I: A random sample drawn from the sampling frame of all Oklahoma conservation district cooperators who are not conservation district directors and have had their conservation plan written or serviced in the last seven years.

Group II: A random sample drawn from the sampling frame of all Oklahoma conservation district cooperators who serve as conservation district directors and have had their conservation plan written or serviced in the last seven years.

Program Characteristics: The items outlined in question 11, Conservation Agriculture and Wildlife Survey.

Selected Soil and Wildlife Conservation Practices: Items (a) through (m), question 17 in the Conservation Agriculture and Wildlife Survey.

Wildlife: Undomesticated game and nongame vertebrate animals, excluding fish and endangered species, which

inhabit the state of Oklahoma, considered collectively.

CHAPTER II

REVIEW OF SELECTED LITERATURE

Introduction

The initial search in preparation for the review of literature pertaining to private agricultural lands and wildlife habitat covered the time period from 1900 to 1983. The earliest pertinent reference to this study was a 1947 article by Aldo Leopold. The period from 1957 to 1976 yielded several useful articles. Since 1976 there has been a flurry of interest in and publications on private agricultural lands and wildlife habitat. However, the only closely related landowner/habitat studies which were found were done in the early 1980s. Current literature from 1984 to date was reviewed as the study progressed.

The review of selected literature is designed to provide the reader with a broad perspective on the private lands issue, to provide information concerning conservation districts, and to integrate related research. These elements contribute to a better understanding of this project. The broad perspective is provided through a review of papers relating to historical background, wildlife habitat programs

on private lands, agricultural trends and land use, and private landowner/habitat research.

The population involved in the study was drawn from the conservation district network in the state of Oklahoma. Therefore, information on Oklahoma Conservation Districts and conservation planning was also included. This research focused primarily on district cooperators' attitudes, condition of land holdings for wildlife, and preferences for conservation programs and practices. The ultimate goal of this study was to provide data which can be used to promote adoption of wildlife habitat programs based on valid soil/wildlife conservation practices.

The Oklahoma Conservation Commission and Oklahoma Conservation Districts

Since Governor E.W. Marland signed the Conservation District Enabling Act on April 15, 1937, the Conservation Districts of Oklahoma have taken a leading role in the development, planning, and conservation of our soil and water resources. Following a format suggested by the United States Secretary of Agriculture, President Franklin D. Roosevelt used the power of his office and his personal influence to strongly encourage states to adopt legislation requiring that on or after July 1, 1937, all erosion control work on private lands be undertaken by the Soil Conservation Service only through legally constituted Soil Conservation

Districts. It was the intent of the legislation that local people would set the priorities for work, since they should know best what was needed in their area.

The early work of the Soil Conservation Districts was limited to flood and erosion control. By 1970, however, it had become evident that the Oklahoma districts were the local leaders of most conservation efforts and this fact was officially recognized in the Oklahoma Conservation District Act of 1970. The Act changed the name from 'Soil Conservation Districts' to 'Conservation Districts' and changed the emphasis to broaden the Districts' responsibilities. The Districts are no longer totally concerned with rural problems, but with urban problems as well.

Conservation Districts are the only local subdivision of state government charged with the conservation of Oklahoma's renewable natural resources. The districts are governed by a five member Board of Directors, three of whom are elected by the local people. The other two are appointed by the Oklahoma Conservation Commission.

The Conservation District Act of 1970 also established the Oklahoma Conservation Commission, previously the State Soil and Water Conservation Board, to assist the Conservation Districts in carrying out their responsibilities. The State of Oklahoma is divided into five areas for the purpose of selecting the members of the Oklahoma Conservation Commission. One Commission member from each area is

appointed by the Governor and confirmed by the Senate. The Commission members then employ an Executive Director and other employees as necessary.

The (1982) multiyear plan of the Oklahoma Conservation Commission notes that "the current trend of declining wildlife habitat can be reversed by applying certain management practices to the land."

The stated goal and objectives of the Conservation Commission for wildlife habitat are:

> Goal:
> Promote establishment of additional wildlife habitat and maintain existing habitat.
>
> Objectives:
> Support the efforts of the Oklahoma Department of Wildlife Conservation in promoting and maintaining wildlife habitat.
>
> Work through the local Conservation Districts to encourage conservation practices which are beneficial not only for erosion control and water quality, but also for wildlife.
>
> Promote the establishment and maintenance of windbreaks.
>
> Encourage Conservation District personnel to include establishment of wildlife in conservation plans prepared for landowners. (pg. 23)

Horvath (1976) called the basic conservation plan:

> the single biggest opportunity for converting present agricultural land to wildlife habitat and maintaining that land in habitat, since it provides direct access by conservation agencies to landowners through signed agreements. (pg. 505)

The delivery system revolves around the relationship of landowners and conservation districts (Henson et al., 1977).

Landowners request assistance through local conservation district offices and the Soil Conservation Service provides technical assistance to these landowners through the district network. The SCS conservationist takes the objectives of the landowner and the capabilities of the land into consideration as he begins to develop a conservation plan for the landowner. The planning procedure usually proceeds as follows:

1. Request for assistance by landowner.
2. Conservationist and landowner determine objectives.
3. Inventory of natural resources is made.
4. Conservation needs are determined.
5. Alternatives are formulated.
6. Findings are presented to landowner.
7. Landowner makes final decision.
8. Landowner and conservationist develop a final tailored conservation plan.

The conservation plan usually contains several items. The plan folder contains inventories, alternatives, a plan map, record of decisions, plant science information, engineering notes, soils information, and a signed agreement sheet.

According to Henson et al. (1977) and Teels (1985), many opportunities exist in conservation planning for enhancement and preservation of wildlife habitat on all classes of land. Teels also advocates wildlife as a secondary land use on all classes of land. According to Teels, most landowners will manage for wildlife as long as it doesn't interfere with their primary land use.

Background

McConnell and Harmon (1976) give a brief but detailed history of agriculture and its effects on wildlife in America as paraphrased below: Presettlement effects were largely due to manipulation of grasslands and forests for agricultural purposes by American Indians. Small cultivated fields in various stages of clearing added diversity to the habitat. Settlement by the white man from 1600 to 1800 brought additional changes. The first settlers came in search of gold, spices, fur, and timber. Faced with starvation due to irregular and inadequate supplies from Europe, they turned to farming. Their cleared land, introduced crops, and livestock had both positive and negative effects on wildlife populations.

Rapid changes took place between 1800 and 1900. Populations expanded westward as wars, treaties, and purchases increased the amount of farmland available. Technological advances such as tile drainage, the cotton gin, the cast iron plow, the mechanical grain reaper, and gang plows revolutionized agriculture and had a tremendous impact on land use. The Homestead Act of 1862 encouraged settlement of the plains area. Overgrazing caused wildlife to suffer along with livestock, and fencing and plowing changed the grasslands forever. At first the small grain farmer benefited wildlife through increased diversity and food, but as

farms increased in number, the wildlife dependent on grasslands declined.

At the close of the 19th century, mechanization had a tremendous effect on agriculture in this country. As the tractor replaced 27 million mules and horses, approximately 81 million acres were diverted to use for beef and dairy cattle or retired from agricultural production. As retired acres reverted to grasslands and forests, many wildlife species benefited. However, during World War I, much of this marginal land was put into production and livestock numbers increased. At the close of the war much of this same land was abandoned without proper vegetative cover. Drought conditions in the plains made the problem even more critical. Winds eroded the topsoil and approximately 50 million acres of America's richest agricultural land blew away. Out of this disaster came the Civilian Conservation Corps (CCC), Tennessee Valley Authority (TVA), and Soil Conservation Service (SCS). Land abuse had taken its toll on wildlife populations in the midwest.

Soil conservation and habitat improvement went hand in hand in the conservation program initiated by the SCS in 1937. Conservation Districts were formed and by 1940 nearly six million farms, involving approximately 50 million acres, were engaged in soil conservation programs. Soil and wildlife conservation efforts created a diversity of food and cover for wildlife, and attitudes toward conservation

programs improved.

Following this period of positive conditions for wildlife government agricultural programs and improved equipment encouraged intensive farming, and 252 million acres of tall grass prairie all but disappeared. Agriculture's production capacity began to exceed demand due to improvements in farming techniques, machinery and crop varieties. The application of World War II technology to agriculture introduced a trend toward larger equipment and large fields. According to McConnell and Harmon (1976), much of the work done by SCS in the late 1930s and 1940s was undone in the 1950s, 1960s, and 1970s, and many wildlife populations experienced downward trends as a result.

Congress initiated land retirement programs in the 1950s and 1960s. At one time or another these retired lands benefited many species of wildlife. The Soil Bank Program enacted in 1956 helped stabilize fluctuating prices that had ruined thousands of farmers. This retirement program had multiyear contracts, which benefit wildlife. Enrollment in the program continued through 1960, and the last contracts expired in 1969. About 29 million acres were enrolled in the program at its peak, most of which provided excellent cover for wildlife.

Wheat and feed programs of the 1960's and early 1970's involved annual contracts, thus the potential for wildlife habitat on an average of 50 million acres annually was never

reached. The short duration of the contracts and lack of wildlife habitat promotion from top USDA administrators were reasons for many unrealized wildlife benefits (McConnell and Harmon, 1976).

McConnell and Harmon offer the perspective that as agriculture has intensified in recent years, the benefits of conservation programs have swung toward increased production and less wildlife benefits. Teels (1984) indicates that the benefits are still available but not taken advantage of by the landowner. He feels it is not the benefits which have changed but the program choices made by the landowner. Erosion, overgrazing, alteration of wetlands and waterways, and capital intensive monoculture systems are all conservation problems to be dealt with today. These factors are primarily detrimental to many wildlife species and beneficial to few. Often these problems are created by economic gain on a short planning horizon and occur on private lands. Wildlife habitat has been unable to compete with the causes of these problems (Hoover, 1976; McConnell and Harmon, 1976).

Economics

Wildlife on the farm has almost always been considered a byproduct. Its status has been closely tied to economics and the intensity of land use. The difficulties in valuing a common property resource which is produced at private

expense is perhaps the most perplexing problem in the habitat/private lands question.

In a paper by Bolle and Taber (1962), the restatement of the problem identified by Leopold many years ago can be seen. While wildlife agencies and administrators were studying the costs of administration, expenditures of sportsmen, and value of meat and fur harvested, little attention was given to the area of production. Most efforts were aimed at the economics of consumption. Bolle and Taber recognized the private agricultural landowners' problem. The principle objective in owning agricultural land is to realize a maximum profit on the capital invested. The pattern of land utilization which is consistent with decisions made on economic grounds results in a steady loss of habitat.

From the standpoint of farm production and income, wildlife is not usually included in management decisions. The farm can be divided into two units, production and household, according to Bolle and Taber. Wildlife may have value in the household unit. Hunting, viewing, and social advantages may be evident to the landowner, but public hunting pressure may develop into a disincentive to maintain wildlife habitat.

Wildlife still has no real defined market value other than the aspect in which leasing of land may provide a market value for habitat. Bolle and Taber advocate free

hunting based on personal acquaintance for the rural hunter and user pay "reasonable costs" hunting for the urban hunter. Another suggestion by Bolle and Taber, other than direct compensation to landowners by hunters, was incentive payments through Agricultural Conservation Programs (ACP). They advocate vigorous efforts to provide cash income to the farmer as a method to enhance habitat and increase wildlife abundance.

In additions to competing with agricultural production, wildlife habitat must compete with other uses of the land. Hoover summarized the loss of habitat to competing uses in this country in a 1976 paper. He indicated that the failure to identify real wildlife values creates a problem in land use planning since no good system has yet been articulated for establishing such values. Hoover called for federal and state agencies to develop a valuing system and to actively work with planners, developers, political entities and public and private utilities. He advocated that the current trend of wildlife agencies contracting with the agricultural economics departments of cooperating institutions to conduct wildlife/economic research be continued.

Applegate (1981) examined landowner behavior dealing with wildlife values. He contrasted the behavior of landowners who perceived the economic values of wildlife with those whose principal reward from wildlife was noneconomic. A series of case studies were used to reach conclusions

about each group. Economic values were considered in New Jersey, Maryland, and Texas (in which leases are the primary consideration). Noneconomic values were considered in West Virginia and New York. Landowners who owned small parcels, or were not economically dependent on their land, were the focus of this section.

Applegate drew some interesting conclusions from his case histories of landowners who realized the economic value of wildlife. He found that the prediction that "user pay" would make wildlife competitive with other agricultural uses had not come to pass, i.e.:

> Whether economically rational or irrational, the behavior of landowners is sufficiently similar in diverse circumstances to conclude that economic return from leasing of hunting rights will probably not result in significant changes in habitat management on private lands. (pg. 69)

He did indicate that some landowners are willing to adopt habitat management programs when direct economic incentives are available. These incentive programs do carry a high cost and are easily subject to changes due to changing economic conditions. Applegate felt that landowners who are not economically dependent held the greatest promise for wildlife habitat preservation and improvement. There is uncertainty as to the longevity of this trend as well, i.e.: economic changes could bring about land use changes on these lands also. Applegate's findings point out the diversity of factors which are an influence on wildlife habitat on

private lands. Programs which are highly successful in a particular geographic area due to appropriate ecological, agricultural, social, and market conditions may fail miserably in another geographic area. This points to a need for research to establish baseline information on these conditions. The private landowner holds the key yet has been ignored most often in research efforts.

Economic considerations are also an important aspect of the human dimension of private lands habitat research. The incentive programs previously mentioned are subject to economic pressures. Bishop (1981) examined economic considerations affecting landowners. He emphasized the potential for market failure conditions and outlined suggestions for solutions to the market failure. His work offers an easily understood explanation of market failure and provides four case study examples. Bishop explored the distortion of incentives to private landowners by wildlife related market failures.

In the market system, prices normally guide landowners toward economically sound decisions. Market failure occurs when prices created in the market do not adequately reflect the preferences of consumers or other economic interests. The benefits from wildlife produced accrue to the landowner. Wildlife is a common property resource which does not respect political and property lines designated by humans. The common property status of wildlife places the production

inputs (habitat) in a competitively perilous situation. This can lead to market failure and lack of adequate protection for habitat.

The mobile nature of wildlife is a major problem, causing market signals (prices) to be distorted. If wildlife were immobile it could be considered a crop just as are wheat and soybeans. Landowners would receive signals from the market which would allow them to make decisions concerning how much land should be allocated to each crop, including wildlife. The mobile nature of wildlife makes it too difficult and costly to create a complete set of market linkages between producers and consumers (Bishop, 1981). The result is less incentive for landowners to maintain wildlife habitat relative to more conventional crops. The present market system fails to give either producer or consumer proper signals.

Bishop advocates the use of subsidies, taxes, and regulations to restructure incentives and keep land in private ownership. Politically viable regulatory systems would have to shoulder the burden where large amounts of agriculturally productive land are involved. The regulations would be designed to adequately balance wildlife and landowner interests. Bishop (1981) warns that we must not rely on the "invisible hand" of the market to achieve wildlife goals. If we do rely on the market we

face continued erosion of our priceless wildlife

> heritage, not from economic necessity , but as a result of distorted signals to private landowners from the market system. (pg. 85)

Government Policies and Programs

Programs and policies relative to habitat on private lands in this study can be divided along state and federal lines. On the federal level, USDA agencies have a tremendous impact on private lands habitat. On the state level, state wildlife agencies and local conservation districts also have an impact. The literature is filled with a variety of opinions concerning the benefits and detriments of these programs. The papers reviewed in this section cover program goals, program components, case studies of state programs, land retirement programs, and planning opportunities. The articles included were selected as representative of the program diversity and variety in the field.

Twenty-eight years ago, Berryman (1957) outlined the need to take a new approach toward wildlife habitat preservation. Since then, programs designed to enhance habitat and programs designed for other purposes have benefited wildlife. Most of these programs were built around components which served as some type of incentive to encourage landowner behavior toward conservation action on their land. These programs have been controversial and have experienced varying amounts of acceptance and success.

Land retirement programs such as the Soil Bank and acreage diversion and set aside programs have been around for almost 30 years. These programs hold much promise for wildlife but lack of promotion of wildlife benefits has been a problem. In 1973 Harmon and Nelson, studying wildlife and soil considerations in land retirement programs, made the following assumptions: (1) farm wildlife has many positive values, (2) farm wildlife is a byproduct of agriculture, (3) habitat for farm wildlife is declining, (4) wildlife managers must accept the economic constraints placed on farmers and (5) land acquisition, cost sharing for habitat development, and information and education work by state wildlife agencies have not succeeded in maintaining farm wildlife populations.

Harmon and Nelson cite two reasons for land being taken out of production: prices in the marketplace and government controls. They identify four programs, the most well-known being "diverted" or "set aside" acres. Such a land retirement program is based on establishment of "base acreages" for farms growing targeted crops. A condition which has to be met to be eligible for set aside payments, price supports, or commodity loans is retirement of a percentage of the farmer's base acreage. An approach very similar to this was used with the 1982 Payment in Kind Program (PIK) which resulted in almost 85 million acres being set aside.

Percentage set aside programs seem to be more socially

and politically acceptable than whole farm retirement, according to Harmon and Nelson. Short term (annual retirement) has also gained more acceptance than long term retirement. They criticize the attitude of Agricultural Stabilization Conservation Service (ASCS) toward ecological considerations such as soil erosion on set aside acres. They state that spot checks by ASCS document only acreage and productivity while ignoring land abuse. Land retirement programs should be considered in terms of more than short term, single purpose objectives. With minor modifications of ASCS policy Harmon and Nelson felt that set aside acres could be much more valuable to wildlife and that the erosion problems on diverted acres could be controlled. They recommended state advisory committees to provide recommendations to state ASCS committees for developing and promoting cover management practices for set aside acres.

One option for the use of the unharvested crop in the 1982 PIK program was wildlife food plots. Under the ASCS eligibility requirements, six conditions were identified for the food plot option (Teels, 1985):

1. The practice had to be selected by the final reporting date.
2. The practice had to be covered in an unharvested crop of specified wildlife food and left standing during the summer and fall period of the year.
3. The plot had to be located near natural cover so wildlife would have escape and protective cover.
4. A cover crop must be used which would mature and remain standing during the winter.

5. The cover crop should also comprise at least one fourth acre.
6. The cover crop should be protected from herbicide and insecticide applications.

While the PIK program was primarily a set aside program, it also offered incentives for landowners. Incentive programs which enhance production and benefit wildlife are also an option for landowners. Incentives to enhance timber and wildlife management on private lands were advocated by Shaw and Gansner (1975). The concept of incentives deals with the needs of two groups--landowners and society. Incentives work on the following principles: (1) society has specific needs, in this case wood and wildlife; (2) society cannot satisfy these needs unless landowners will change their way of operating; (3) an agreement is negotiated where society pays landowners to change; (4) both parties are satisfied with their costs; and (5) landowners change and both parties are satisfied.

Shaw and Gansner point out that careful planning and targeting are essential for making incentives effective. They propose tax breaks and ASCS cost sharing as two effective incentive programs. A tax break on land kept in a desired type of cover would help prevent changes in land use. This idea has worked with varying effectiveness. The ASCS first offered incentives for timber growing practices in 1936 and additional incentives for wildlife habitat improvement practices in 1962. There has been no real

effort to coordinate the two.

Horvath (1976) explored opportunities and constraints on habitat programs and recreational opportunities on private lands. Horvath noted negative trends in habitat for wildlife but expressed that there was hope through conservation district programs.

There are several other constraints to developing wildlife habitat on private lands. Prices for farm commodities place producers under severe economic strain. Land may be brought into or taken out of production as the market fluctuates. Lack of technical assistance due to government hiring freezes and education of personnel can sometimes make it impossible to carry out a plan. Proper follow-up is essential if implementation is going to take place. Decreased Agricultural Conservation Programs (ACP) cost sharing can detrimentally effect implementation of conservation practices beneficial to wildlife.

Horvath (1976) indicated that if a producer has the ability to produce on less land, he will. The current trend seems to contradict this statement. More marginal land is being brought into production in hopes of making or increasing a profit in a depressed farm economy. Horvath also noted trespass can discourage habitat development and close lands to public recreation of all types. This statement agrees with the findings of several other studies (Bolle and Taber, 1962; Sheriff et.al., 1981; Sebert, 1982; ODWC,

1984).

Constraints upon recreational use of private agricultural lands also exist. Lack of information for landowners concerning liability, feasibility, promotion, and regulation is a problem. Lack of useful research results and lack of specific planning assistance to the private sector also contribute to the problem. Horvath notes that most of the Statewide Comprehensive Outdoor Recreation System (SCORP) plans for states are lacking in recommendations to the private sector. Technical assistance for the landowner desiring development of recreational opportunities is also close to nonexistent. A wide range of considerations such as natural resources inventory, potential market, management, and financial capability need to be taken into account before a landowner enters a recreational enterprise. If the opportunities revolve around wildlife, ample quality habitat must be present initially. (Teels, 1983).

Gottschalk (1977), McConnell (1981), and Deknatel (1979) each offer descriptions of four types of state habitat/land use planning and programs/wildlife habitat development, wildlife habitat preservation, habitat development/public access, and public access make up the bulk of the state efforts.

Several states have been leaders in habitat development programs. The state of Nebraska has one of the better known habitat development programs (McConnell, 1981).

Ninety-seven percent of the land in Nebraska is in private ownership. In 1976 the Game and Parks Commission entered into a cooperative program with the natural resource districts, the equivalent of an Oklahoma Conservation District. The program is funded by a $7.50 habitat stamp which is required to hunt. The program is designed to create habitat or maintain and improve existing habitat. The decision to allow access is left to the landowner. Formal agreements between districts and cooperators make the cooperators eligible for four wildlife conservation practices. Payment is shared, with Game and Parks paying 75 percent and the Natural Resource District 25 percent.

Programs commonly known as "Acres for Wildlife" fall under the classification of habitat development programs. Typical signup incentives include free literature on wildlife habitat, boundary signs, and free magazine subscriptions. These programs are primarily oriented toward youth groups, and are recognized for their educational potential. They do little to discourage habitat destruction. An Oklahoma Acres for Wildlife program, in existence since 1971, has 69,588 acres enrolled (ODWC, 1985).

The Texas Parks and Wildlife Commission has a noteworthy program for habitat development and public access. The Texas Shooting Preserve Law gives the landowner an opportunity to lease his lands for hunting under the shooting preserve license. Economic returns and access control

become incentives for managing lands for wildlife within the Texas program. The Texas Cooperative Wildlife Extension program (USDA) provides technical assistance to landowners to develop comprehensive plans. Other features of access programs include protection, development, posting, maps and payments to landowners.

Pennsylvania's Cooperative Farm Game Program, begun in 1936, was judged to be one of the best public access programs in the nation (Gottschalk, 1977). The Game Commission runs three very successful programs, which make about 4.5 million acres available for hunting. Hunters pay no fees and landowners receive no direct payments for use of their land. The Cooperative Farm Game Program began in 1936. In this program, cooperators enter into formal agreements with the commission to allow public hunting for a minimum of five years. Program areas include groups of landowners who hold contiguous tracts totaling more than 1000 acres. Safety zones are established where permission to hunt is required and up to two thirds of the total contiguous tract must remain open to hunting. The cooperators receive property protection, technical assistance for optional habitat development, and a free magazine.

Pennsylvania's Safety Zone program was initiated in 1954. It provides benefits similar to those in the Cooperative Farm Game program to individuals owning smaller tracts of land. Landowners with at least 50 acres may participate

for an unspecified length of time. The cooperative agreement may be cancelled by either party with a written thirty day notice. Other than these differences, the regulations are identical to the Cooperative Farm Game program.

In addition the Forest Wildlife Cooperative Program was launched, in Pennsylvania in 1971. Lands enrolled in this program must be opened for two years and are given additional protection. Protected areas have safety zones, and forest areas must meet a 100 acre minimum.

Voluntary action has resulted in the greatest amount of habitat preservation on private lands. It has been publicly unacceptable for government programs to control every use or provide financial incentive to every private landowner. However, each of these methods hold promise in specific situations.

McConnell (1981) identified four commonalities in successful wildlife habitat/private lands programs. He found that: 1) Programs must be acceptable to landowners. Therefore, their interests, benefits, and their role in making the program a success must be given careful consideration; 2) The successful program must be compatible with the primary land use of the land in question; 3) Programs are most successful when existing habitat can be made suitable with little or no cost; and 4) Habitat type is an influential factor. Habitat programs were found to have been least successful when applied to agricultural lands.

Habitat programs have obvious land use planning implications. Deknatel (1979) drew attention to the fact that they also offer additional opportunities. Habitat programs are aimed at the decision making framework of the landowner. The programs introduce elements of ecological criteria that are not production oriented to the landowner's planning opportunities. Therefore, habitat programs can serve as potential models for "stewardship" or the practice of a "land ethic". These terms denote recognition of long term resource conservation needs and a sense of responsibility to future generations.

Deknatel (1979) states that,

> In this way, these programs get at the question of the attitudes and actual behavior of a landowner or operator... They put most responsibility for a resource in the hands of the persons dependent on it. (pg. 263)

The site related knowledge of the landowner, coupled with his economic and other constraints, can be part of a planning and implementation plan coordination at the conservation district level.

Agricultural Trends and Land Use Practices

The information on agricultural trends and their impacts on wildlife habitat presented in this section is based on a 1982 National Academy of Science study, entitled, Impacts of Emerging Agricultural Trends on Fish and Wildlife

Habitat, was supported by the USDA and the USDI. The study had four objectives. First, existing 10 to 50 year projections for future agricultural trends were reviewed. Secondly, the study identified impacts and habitat changes associated with changing land use patterns. The third objective was to attempt to define policies and practices which would deal with the impacts on habitat. And finally, the study attempted to identify research and information needs. The material here is a synthesis of information pertinent to Oklahoma lands, agriculture, and research needs.

There is increasing pressure on agricultural lands as a growing population demands more food and forest products. In response to these pressures, it is predicted that changes in farm size, cropping systems, farming technology, and land ownership patterns will occur. The impacts of these changes will be both positive and negative for wildlife habitat.

Increasingly intensive and efficient use of cropland, conversion of pasture, range, and forestland to cropland, and loss of prime farmland to nonagricultural uses are general trends recognizable on crop and pasture lands today. More efficient use of cropland will involve larger fields, improved crop varieties, improved agricultural chemicals, irrigation, drainage, and double cropping. These practices have a potentially negative impact on habitat. Prudent use of these techniques, increases in reduced tillage systems, and more efficient use of fertilizers, pesticides, and water

could, however, improve habitats. The NAS study advocated the elevation of the status of wildlife from byproduct to cash crop on farmland. This suggestion conflicts with Applegate's (1981) findings.

Soil erosion is perhaps the greatest external cost in agriculture. It causes decreased productivity for crops and is also detrimental to the production of wildlife. Through reduction of erosion on cropland, wildlife receives benefits in direct and indirect ways. Good vegetative cover on crop and pastureland which meets the immediate habitat needs of wildlife can greatly improve the long term nutritional status of farm wildlife populations.

The Southern Plains Region, made up of Oklahoma and Texas, is an area where habitat is easily and widely affected by agricultural practices. In Oklahoma the clearing of land for livestock use, the conversion of native pasture to tame pasture, the conversion of pasture land to row crops (NACD, 1979), and the depletion of groundwater supplies have all been identified as trends by the study. There are about 213 million acres of land in the southern plains area of which 25 percent is agricultural land. Within this 25 percent, some conversion to nonagricultural uses takes place. By comparison, 30,000 acres of Oklahoma's 40,795,000 acres of agricultural land (USDA-SCS, 1985) is converted to nonagricultural uses each year. More common is the shift in usage from cropland to pasture and back to cropland in

response to market prices and water availability. These changes cause changes in species diversity and abundance for wildlife populations. When long term, stable vegetative communities are not allowed to develop, species of wildlife which benefit from early successional stages are heavily favored.

The researchers found that in specific regions of Texas, wildlife has become an economically successful crop. Commercial sale of deer leases in those areas has gained national attention. In other areas of Texas, as water becomes more expensive (due to decreasing supplies) and other costs rise, combined agricultural and wildlife management objectives may provide economic returns. In that way, some of the "detrimental" agricultural trends could benefit some species in the long run. Teels (1983) cautions that wildlife is a cash crop only when the production inputs (habitat) are already available. Therefore extreme caution is advised when advocating wildlife as a money-making enterprise.

Rangeland in the southern plains region is a unique and valuable resource for both livestock and wildlife. Many big game species are found on the rangelands of the southern and southwestern plains. Most of the highly productive arable land has already been converted to cropland. The pressures to produce on cropland will make careful and efficient use of rangeland increasingly important. Higher livestock

production per unit of land is a trend. This can be achieved using a mixed grazing system or by conversion of rangeland to grasses used by a single type of livestock. This higher production trend implies more tame pasture, better weed control on rangeland, more farm/ranch operations, and improved grazing systems. Tame pasture will be used to balance the seasonal forage supplies. Some irrigation will take place on tame pasture and it is thought that high fertilizer costs will restrict fertilization to mixed and tall grass prairie areas. Conversion to tame pasture can be detrimental to wildlife due to loss of an abundance and diversity of forbs, which are an essential element in the diet of many game and nongame wildlife species.

Although more intensive grazing by livestock is anticipated in the plains region, rotational grazing systems can be beneficial to wildlife (Evans, 1981). If some range plants are allowed to mature before grazing begins, they can serve as food and cover for wildlife. Some of the newer, high intensity grazing systems have not been evaluated relative to wildlife. Forbs and shrubs are of primary concern, because livestock can crop these plants so close that they may be destroyed or hedged so closely that they suffer reduced productivity. Grazing systems can be modified to benefit wildlife but intensity of use remains a critical factor.

The future of wildlife habitat on areas of intensive

use for production of food and fiber is not encouraging. However, according to the NAS study, increased production and quality habitat are not mutually exclusive objectives. Both can be accomplished with intelligent management, e.g.: 1)changes in attitudes and values; 2)research; and 3)consistent public policy. These three recommendations are central to the intent of the district cooperator agricultural lands/wildlife study. The NAS study suggests several strategies for bringing action to the recommendations.

Attitudes and values of the public can be changed in several ways--by promoting the understanding of multiple use and benefits, by developing better systems for enhancing public understanding of the impacts of agriculture on habitats, and by facilitating the adoption of management systems which sustain both agricultural and wildlife output. Policy makers and the public must be educated to recognize the importance of timing when dealing with the dynamic biological world of agriculture and wildlife. Habitat development must be undertaken for specific species at the local level. Local, state, and federal agencies as well as universities are in a position to assist in these adjustments.

The NAS study identifies four major research areas, applicable to a variety of regional and land use situations. First, there is a serious need to assess the effects of current agricultural systems on productivity and on

wildlife. Secondly, consideration of economic, political, and social aspects of land management must be incorporated when practices are developed. A third need is additional research to develop more improved strains and varieties of crops and livestock for more efficient utilizations of our resources. Finally, new understanding at all levels in the area of program development, using incentives and regulations to encourage optimal multipurpose resource use, is needed.

As is evident from the trends, increasing attention is being devoted to examining the compatibility/incompatibility of wildlife and agriculture. Three recent papers were selected for review here because they are believed to be representative of current literature concerning no-till farming and wildlife, soil erosion control practices and wildlife, and wildlife as a secondary use in grazing programs.

The effects of no-till and conventionally tilled fields on several small mammal and bird population characteristics were studied by Basore and Best (1982). The study took place in Iowa where no-till farming has enjoyed a rapid increase: no-till or slot planted acreage in Iowa doubled in one year. No-till fields offer increased cover for wildlife and do not involve repeated tillage which is detrimental to wildlife. While their research was not completed at the time the article was published, trends

showing noticeable differences in wildlife abundance and diversity on no-till and conventional tillage fields were evident.

Miranowski and Bender (1982) attempted to evaluate the effects of soil erosion control policies on upland wildlife habitat. The habitat index model they used requires the three assumptions that were used in this study concerning the habitat requirements of wildlife and the effects of agricultural practices on wildlife habitat. The assumptions are:

> (1) a greater diversity of vegetative types in an area provides a more suitable habitat...(2) that interspersion of vegetative types contributes to wildlife abundance by providing a well distributed source of quality food and cover and (3) that management practices that decrease food and cover for wildlife will reduce the ability of that habitat to support wildlife. (pg. 21)

Results from linear programming analysis yielded several policy implications, i.e.: soil conservation improved upland habitat quality. Some policy options are more effective than others, i.e.: changes in land use tend to have a greater impact than changes in management practices. These findings should serve as guidelines for policy makers as well as conservation planners.

Teels (1983) examined the potential for economic returns from wildlife as a secondary land use (leasing) on grazing lands. He identified critical factors such as size of holdings, proximity to metropolitan areas, and landowner

and hunter attitudes. Most critical was the problem of supply and demand. Before a landowner can meet supply demands he must have habitat which is producing a huntable, sustainable supply population. Teels found that some landowners find habitat management objectionable based on economic reasons. If wildlife as a secondary land use can be integrated into an ongoing farm/ranch operation many landowners find it more acceptable. This type of effort is impossible without careful planning. According to Teels:

> A range management plan with habitat management practices included should be prepared on all lands where wildlife is an objective. Wildlife habitat requirements are specific; habitat elements must be present in fairly exact amounts. The range sites and condition of the plant community not only determine animal units of livestock grazing, but wildlife carrying capacities as well. It is impossible to plan for livestock and wildlife without first looking at these conditions. (pg. 7)

A relatively large body of literature exists on ideas for programs, incentives, and education. Comparatively, very little is known about the impacts of specific practices on specific species. Much research is needed if the compatibility between agriculture and wildlife, so often written about, is to be reached.

Private Landowner/Habitat Research

It is obvious that the private landowner is a key individual in the effort to provide habitat on private lands. Over the years, programs from state and federal

agencies have attempted, through design or side effects, to encourage landowners to provide habitat on their land. Much of the program development has been based on the resource planners' perception of what was needed, and many of these programs have centered around public access. Too few programs have considered the management problems facing landowners who incorporate habitat programs with their agricultural activities. Programs are usually based on agricultural economics and land management practices. To be successful, programs need to give increased attention to landowner attitudes in addition to economics and practices. Many assumptions have been made concerning the landowners' views on wildlife habitat, but very little factual information exists.

The Missouri Department of Conservation conducted an extensive survey of landowners in 1980. The survey revealed much information which supports the emphasis given in many existing programs. The study offered some unexpected results. The response which deviates from traditionally accepted ideas dealt with cash payments as incentives. It has been advocated for some time that cash payments to farmers are the key to giving wildlife habitat the economic status which will protect it. However, monetary incentive in the form of tax considerations was ranked fifth in types of assistance desired by landowners. The concept of direct cash payments seemed foreign to most landowners. Landowners

were unable to recommend appropriate per acre preferred practice reimbursements. Cash payments ranked behind seeds, advice, plants, and tax considerations as preferred types of assistance.

A high interest in wildlife among Missouri landowners was reflected in this survey. Both positive and negative values were noted. Some property damage from wildlife was reported, but it appears that landowners feel such damage is to be expected when wildlife and agriculture are mixed. Damage may impose a substantial economic burden on landowners in Missouri, pointing out a program element missing from many wildlife agency incentive programs. Assistance and training in animal damage control may be a good incentive to promote habitat development or preservation.

The results of the Missouri study provides reassurances as well as challenges. An important finding highlighted by the study is that assistance programs which satisfy farmers and benefit wildlife do not need to be complex and expensive--simplicity best describes the type of field service that is both acceptable to farmers and feasible for agencies. A difficult challenge to wildlife agencies is the commitment of funds and people to carry out private lands programs. The study emphasized the need for effective communication between landowners and agency personnel. The sharing of ideas formally and informally is important in promoting understanding on both sides.

The Oklahoma Department of Wildlife Conservation, Game Division, conducted a landowner survey in 1982-83. Two wildlife associated problems on private lands were highlighted. Habitat degradation and sportsman access were the primary thrust of this study. Ten thousand surveys were mailed to a sample taken from 110,840 farmers and ranchers who participated in ASCS programs in 1981. Of this, 16.5 percent (1,504) of the surveys were returned.

The study yielded encouraging information for habitat improvement assistance in that habitat improvement assistance would be welcomed by 43.4 percent of the respondents, according to the survey. The types of assistance respondents chose in order of preference were:

1. Seed for food plots.
2. Technical advice.
3. Trees and shrubs for wildlife plantings.
4. Tax incentives.
5. Direct cash payments.

Another large percentage, 46.6 percent, indicated they did not want habitat improvement assistance information the Wildlife Department found discouraging regarding access. Almost 48 percent of those who did not want assistance stated that they based this decision on the fact that they did not want to attract hunters.

Factors Affecting Adoption of Programs and Practices

A number of socioeconomic factors have been found to be

associated with adoption of conservation practices. These characteristics have been categorized as (1) farm characteristics, (2) farmer/landowner characteristics, (3) societal and institutional characteristics, and (4) characteristics of the practice or innovation.

Size of farm, tenure, and farm income have frequently been studied as farm characteristics which relate to adoption of conservation practices. Farmer/landowner characteristics such as age, education, and attitudes have often been examined for their significance in prediction of adoption of conservation practices. Societal and institutional characteristics have appeared less frequently in conservation practice adoption studies than farm and farmer characteristics. However, Clearfield (1984) noted that the socioeconomic and political organization of a locality certainly makes a difference in the amount of innovative (i.e., adoption of conservation practices) activities which take place in the locality. According to Basu, Osgood, and Diggs (1982), researchers in the area of resource conservation have begun to realize that community characteristics and attitudes may also be as important as individual characteristics and attitudes in the adoption of conservation practices.

Perhaps most central to this research project are the characteristics of the innovations (practices and/or programs) themselves. Researchers have found that farmers do

not adopt conservation practices in a random or haphazard manner (Carlson, Dillman, and Lassey, 1981). Nowak (1982) identified four characteristics which explain adoption or rejection of an innovation:

> 1. Compatibility - the extent to which the conservation measure is consistent with both a landowner's agronomic and social value systems.
> 2. Complexity - how difficult the practice is to use.
> 3. Flexibility - the extent to which a conservation practice can be molded or manipulated to increase compatibility with the existing agricultural system.
> 4. Divisibility - extent that a practice may be tried on a limited basis prior to full-scale adoption; also, the amount of investment required.

The sometimes frustrating nature of social science research findings can be seen in the conclusion drawn by Basu (1983):

> It is generally accepted that farmers and landowners will not adopt conservation practices unless they are economically feasible. Research has shown us, however, that the situation is not nearly as simple as this statement would imply. For one thing, a practice may be economically feasible from an objective standpoint but will not be perceived as feasible by the farmer, who will not adopt it. Occasionally, a practice that appears to be economically infeasible on the basis of objective criteria will be adopted nevertheless.
>
> Clearly, there is more to the problem of adoption that economic feasibility. Numerous other factors, as the research cited in this paper has demonstrated, are significant. The farmer's decision is influenced not only by economics but also by such factors as age, education, attitudes, ownership, and institutional and community influences. A program that sets a high level of adoption as a goal cannot ignore these socioeconomic factors that are so important to the decision making process. An awareness of the characteristics of the client group and its social setting can help agency personnel to understand

the kinds of approaches and incentives necessary to achieve acceptability and accomplish conservation goals.

It is obvious that a number of factors influence participation and adoption. Agency personnel need to have an awareness of the characteristics of their client groups.

Summary

Several general conclusions pertinent to this study can be drawn from the review of literature. Most critical is the fact that wildlife habitat on private lands is disappearing and the quality of the remaining habitat is degenerating. Habitat programs which do not consider agricultural and economic constraints on the landowner have failed to provide adequate habitat on private lands over long periods of time. Private landowners (agricultural producers in particular), as managers of a high percentage of land in agricultural states like Oklahoma are fundamental to wildlife habitat maintenance and improvement.

Wildlife, as an unpriced byproduct of agriculture, cannot compete with cash crops under traditional strategies in the modern business of agriculture. Cash incentives to make wildlife competitive with cash crops do not appear to be as popular as once thought. New programs are necessary which provide long term incentives for agricultural producers to consider wildlife in the plans for their land. These programs need to be compatible with agricultural production,

cost effective, flexible, and targeted to specific regions. Abuse of property rights through improper access is a major disincentive to agricultural producers to manage for wildlife. New programs should not carry the access price tag or should include a component for dealing with access which is satisfactory to the landowner. The problems are admittedly complex but progress can be made. The key to this progress is the landowner.

The diversity of program options and their success or failure in different geographic locations points to the need for research in two major areas. There is a real need for to quantify the impacts of agricultural practices on wildlife. This research is critical in the face of the rapid change in farming technology. Equally important is the need for more information on the attitudes of landowners and their preferences for practices and programs.

In Oklahoma, the conservation district network allows planners to work directly with landowners at the local level. The programs available provide multiple benefits to the landowner and relative to wildlife habitat carry no public access price tag. The potential for incentives exist through the multiple benefits of soil/wildlife conservation practices.

Baseline data on landowner attitudes toward wildlife and wildlife habitat on private lands are needed for more effective planning and program implementation. Information

on landowner preferences for types of assistance, conservation practices, and program components is needed if the trend in declining quality of habitat is to be dealt with effectively.

CHAPTER III

METHODOLOGY

The sections that follow describe the methodology used to meet the research objectives of the study.

Population and Sample

The sampling frame for this research was as follows:

Group I: All Oklahoma conservation district cooperators who are not conservation district directors and have had their plan written or serviced in the last seven years.

Group II: All Oklahoma conservation district cooperators who have had their plan written or serviced in the last seven years and who serve as conservation district directors.

From this sampling frame a systematic random sample of names and mailing addresses was drawn subject to guidelines for sample size dictated by the Oklahoma Conservation Commission. A sample of three-fifths of all conservation district directors was drawn and 10 cooperators from each of 87 districts was drawn. One district declined to participate, and one set of names was received after the established deadline. The Commission gave permission to survey

three of five district directors from each of 89 districts and permission was granted to survey 5 cooperators from each voluntarily participating district. Ten cooperator names were drawn in hopes the study could be expanded; however, funding did not permit expansion. The additional names did permit replacement filler names if letters were returned undeliverable, only one substitute mailing was made per letter initially returned, undeliverable. Substitute names were drawn from the same district as the addressees for the undeliverable letters. Substitute mailings yielded five additional survey responses.

The Commission specified that due to the nature of the information requested complete anonymity had to be guaranteed and it was agreed that nonrespondents would not be pursued or contacted. No study of nonrespondents was undertaken, so no evaluation of possible nonresponse bias can be offered.

The systematic random sample was accomplished by using a table of random numbers to select a specific starting entry in the cooperator/director files. Every n^{th} name was selected until the desired sample size was reached.

The primary considerations that influenced the determination of sample size were of both a statistical and a pragmatic nature. Those considerations were:

1. Variance (on the variables of interest) in the population;
2. Margin of error acceptable, that is, willingness to accept an estimate that is within five percent of the actual percentage;

3. Risk that is inherent that the actual error should exceed the desired margin of error, that is, the alpha level;
4. Alpha level utilized and found acceptable in similar research; and
5. Monetary, manpower, and time resources.

Design

The survey design in this study utilized a self-administered, mail-back questionnaire sent to the sample of cooperators and directors. The questionnaire was designed using techniques described by Dillman (1978) and Sudman and Bradburn (1982). The results were collected, coded, analyzed, interpreted, and reported.

A pilot study phase preceded the actual solicitation of responses from the sample used in the study. The pilot phase consisted of two parts, pretesting and a field test. Pretesting validation began with the personal distribution of the questionnaire to associates, agriculture and wildlife professionals, and doctoral committee members. Personal interviews were arranged where time permitted to discuss each item on the questionnaire.

The discussions focused on such aspects as the interpretation, format, wording, and sequential order of the items on the questionnaire. Those persons were very helpful in recommending modifications, changes in choice of words and items that should be included or deleted. Those revisions were incorporated in the reprinted questionnaire.

The second phase of the pilot study involved

administering the revised questionnaire to 50 randomly selected district cooperators. District managers distributed the questionnaires and made it possible to interview selected participants.

The field test was conducted for one primary reason, in order to identify possible sources of bias resulting from misunderstanding of statements or directions and difficult wording. Again because of an agreement of complete anonymity and respect of privacy, nonrespondents were not pursued.

Responses from the sample were solicited through a single mailing followed ten days later by a thank you/reminder postcard. The initial mailing contained a cover letter, a questionnaire, and a stamped, preaddressed envelope for return. Each packet required $.61 postage for round trip mailing.

A total of 435 questionnaires were mailed to Group I (cooperators) and 267 questionnaires were mailed to Group II (cooperator/directors). Twenty-four questionnaires were returned undeliverable or uncompleted. Of the 435 in Group I, 236 responded for a response rate of 54.2 percent. Of the 267 in Group II, 200 responded for a response rate of 74.9 percent. The data on thirty of the questionnaires returned were deemed unusable.

The response rate for district directors was exceptional but not surprising since the directors are a collectively identifiable group of persons who should be more knowledgeable about conservation agriculture than the district

cooperators. The response rate of 54.2 percent from the district cooperator group was surprising and high by comparison with generally low response rates to mail questionnaires. Return rates of less than 40 percent are common with higher percentages a rarity (Kerlinger, 1973).

The mail questionnaire was the survey method selected for this study based on its use in related studies and its adaptability for use by government agencies and for its relative inexpensiveness as compared with alternate survey methods. The lack of sufficiently high response rates and inability to check given responses are two possible defects in the use of mail questionnaires unless it is used in conjunction with other techniques (Kerlinger, 1973). Response rate was sufficiently high for this study. Pretest of questionnaires and a pilot study were also used to try to reduce nonsampling error. It was beyond the capabilities of the study to sample nonrespondents on a formal basis. But enhanced confidence in the validity of returns was gained as a result of anecdotal data gathered from informal interviews with a small number of pilot study nonrespondents.

Instrumentation

The instrument development phase of the research included several identifiable but interrelated processes:

1. Selection of an appropriate measurement scale;
2. Development of a set of items to measure attitudinal variables;
3. Preparation of items to measure the conditions of properties for wildlife habitat (diversity

rating);
4. Preparation of items to indicate preferences for practices and programs;
5. Preparation of items to measure the demographic socioeconomic variables;
6. Selection and editing of questionnaire statements;
7. Format layout and design; and
8. Consideration of validity and determination reliability.

Various data-gathering techniques are more appropriate in certain research designs than in others. Likewise, some scales of measurement are more appropriate to certain types of research than are others. Oppenheim's 1966 review of the literature concerning the construction of scales of measurement indicates that there have been few major advancements since the Thurstone and Likert methods were developed. Among the approaches to attitude measurement in the literature, the two used most often are still the Thurstone and Likert scales. The usefulness of the Likert scales in related human dimension of natural resources research has been demonstrated (Warner, 1981; Birdwell, 1982).

The Likert-type scale was selected for use in this research for a number of reasons. The relative ease of construction adhered to one of the basic premises of this project, that is, the methodology and instrument itself should be adaptable and usable by other researchers. The Likert-type scale has features which make it an excellent tool in this type of project. The scale requires relatively less time from respondents than other methods. The scale has a wide range of application and it can be used with a

large number of test items (Kerlinger, 1973).

In this study, the Likert format was applied to questions dealing with preference for practices, diversity rating, land use, and preferred programs. It was felt that maintaining this format and layout consistently through the questionnaire would simplify the task of responding.

The Likert type scales were applied to questionnaire statements developed and compiled by the author. There are five possible responses to all but two Likert scaled items. Exceptions are four choices offered on question 15 concerning types of assistance landowners would be likely to use and question 17 concerning willingness to use selected soil/wildlife conservation practices. The responses ranged from positive to negative with the possible responses to the attitude questions labeled strongly agree, agree, undecided, disagree, or strongly disagree. Equivalent responses were developed for other items using a similar format (Appendix A). The categories were scored by assigning values 5, 4, 3, 2, and 1 respectively. Recoding and weighting scores for the practices section based on the diversity assumption was done by a computer program. The weighting process was developed through consideration of elements of the assumption of diversity and discussion with wildlife and agriculture professionals. A formal statement of the assumption was taken from a habitat index model used by Miranowski and Bender(1982). Properties scattered through a large geographic area made the use of a sophisticated habitat index

model infeasible. A key to the valuing of responses appears in Appendix B.

The undecided response was coded as a value of 3, but it was placed as the last choice in the listing of the choices (SA, A, D, SD, U) in an attempt to reduce any central tendency error resulting from persons who, unfamiliar with the subject content, might tend to rate each item down the middle of the rating scale (Kerlinger, 1973). In the attitude section a strongly agree response to a positive statement was scored as 5, while a strongly disagree response was scored as a 1. By contrast, a strongly agree response to a negative statement received a value of 1 and a strongly disagree received a value of 5. An individual's total score represented the sum of ratings for all items answered in that section. Specific weights assigned to responses appear in Appendix B.

For the attitude section a large number of statements of opinion were developed and collected concerning wildlife and wildlife habitat on private lands. From this array of statements a number of statements were selected and edited according to the following criteria (Edwards, 1957):

1. Statement should contain only one thought;
2. Statement should be simple and clear;
3. Statement language should be short, rarely exceeding 20 words;
4. Statement should not contain ambiguous words;
5. Statement should not be factual; and
6. Statement should not be capable of being interpreted in more than one way.

A total of eight statements were selected following

discussions with peers, professionals, and pretesting to solicit evaluation data concerning appropriateness of survey items. Through a very similar procedure items concerning current land use, preferred practices and program components, and reasons for participating in conservation programs were developed and collected.

Since appropriate existing scales of measurement were not found in the literature, scales were developed by the researcher. A modified Likert type scale was adapted by listing the appropriate items and offering a range of responses (Appendix A). The respondent selected the response that best expressed his or her feeling or involvement with each item.

The last section of the questionnaire contained questions concerning demographic socioeconomic variables about the respondent. The respondent was asked to check one of the categories provided in each item, or in the case where none of the categories might apply, the respondent was provided with an open-ended category for writing in an appropriate response; the latter was rarely used.

The socioeconomic variables were selected for two primary reasons:

1. These variables provide a descriptive profile of the demographic characteristics of the respondents; and
2. Related research has shown a relationship between these variables and the types of attitudinal responses that can be expected.

When measuring simple attributes or physical

characteristics of persons or objects, validity is not a great problem (Kerlinger, 1973). In behavioral research where objects are not always so easily measured, validity often becomes a very important question. A distinction can be made between validity and reliability. Validity is concerned with the question: Is the item measuring what we want it to measure?

Kerlinger (1973, pg. 457) indicates that "... there is no one validity. A test of scale is valid for the scientific or practical purpose of its user." The validation of an attitude measurement scale is very difficult (Shaw, 1967). Three types of validity are commonly accepted: content, criterion-related, and construct. Content validity is concerned with the sampling adequacy of the content of the questionnaire, that is, did the statements measure the desired domain of aspects associated with the referent object? "Content validation consists essentially of judgement" (Kerlinger, 1973, pg. 457). Questions at polar ends of the spectrum were designed in some instances to help verify the validity of responses. Criterion-related, or concurrent validity is concerned with predictive ability associated with practical problems, while construct validity is concerned with theoretical constructs.

Reliability addresses the question: If the same subjects of referent objects are repeatedly measured with the same of comparable measurement instrument will the same of similar results be obtained? (Kerlinger, 1973) Several

measures were taken to improve reliability in the design and layout of the mail questionnaire used in this research investigation. In this project an effort was made to: (1) write clear and simple directions and provide an example; (2) maintain consistency in layout; (3) write unambiguous statements and questions; and (4) provide an adequate number and comparable quality of statements.

An internal analysis of each of the Likert-scaled sections of the questionnaire yielded eight Cronbach's alpha reliability coefficients. Cronbach's alpha reliability coefficient can range from zero to an absolute value of 1.0. For the eight tests, the Cronbach's alpha ranged from a low of .54 to a high of .86 (rounded).

Data Collection

The mail questionnaire was designed to provide a demographic profile of respondent's personal characteristics, the relative condition of their holdings for wildlife habitat, their attitudes toward wildlife and wildlife habitat, and their preferences for practices and programs. The review of related literature produced relatively few wildlife/private lands studies involving social variables and conservation programs and provided only four instruments of any kind in this subject area. Instruments from other natural resource related studies were pursued and while they influenced this study they were not appropriate for use. The Missouri land and wildlife survey was perhaps most

useful and provided a starting point for instrument development.

A six page (three 14" by 8 1/2" sheets folded in half and saddle-stiched) questionnaire was printed in black ink on cream colored paper. Special artwork depicting farm equipment, farm scenes, and wildlife was designed for the cover and inside pages after consultation with layout and graphic experts (Appendix C). The letter which accompanied the questionnaire was printed in black on the official letterhead stationary of the Oklahoma Conservation Commission. The letter was signed by the executive director of the Oklahoma Conservation Commission (Appendix C). Imprinted envelopes of the Commission were also utilized for transmittal to the recipient, but the enclosed, self-addressed stamped envelope was plain bond. In an attempt to increase response, each outside envelope was hand addressed.

Data Analysis

The data from the questionnaire were entered into the computer system at Oklahoma State University by OSU computer center technicians. The data were cross checked and hand verified after system entry. No data entry or program errors were found. Following confirmation all data were analyzed through the computer center using the SAS statistical package.

The principal statistical procedures used in analyzing the attitudinal and demographic data was the chi-square

statistic. The nonparametric chi-square statistic yields a value which represents the disparity between actual and observed frequencies falling into each data category. As there is a greater disparity the chi-square value increases until it becomes statistically significant. The Students T-test was utilized to compare means between the two groups. The parametric and robust T-test yields an index of the significance of the differences between means of two sampled groups. The T value increases as the means are significantly different. The Pearson correlation coefficient was used to meet research Objective 3. Pearson Product Moment Coefficients of Correlation can range from -1 to 1, and the higher the value, the more positive the correlation.

The rejection of null hypotheses was set at an alpha level of .05. The .05 level of confidence means that an obtained result that is significant at the .05 level could probably (by chance) occur about 5 times in 100; this level has been quite acceptable in research similar to this investigation.

The .05 level was originally chosen (Fisher, 1950) and has persisted with researchers because "it is neither too high nor too low for most social scientific research." Other researchers (Skipper et al., 1967) suggest that rather than "blind adherence" to reporting a relationship between data as significant or not significant, the actual probability level should be stated. Because the writer recognizes that there is a difference between statistical significance

and social significance, the p value was also reported in this study. Using the p value, determination of significance is left to the interpretation of the reader.

Research Objectives, Related Research Questions and Hypotheses Statements

The research objectives of this study were developed following the review of literature, discussion with landowners, and discussion with wildlife and agriculture professionals. The objectives of this study were:

Research Objective #1:
Using an attitude scale to determine the positive or negative nature of the attitude of district cooperators in the study towards wildlife and wildlife habitat.

Source of Data:
Survey question #20 was the source of these data (Appendix A).

Null Hypotheses:

H_o^1: There is no significant difference in the number of district cooperators in the study who have positive attitudes toward wildlife and those who have negative attitudes toward wildlife.

H_o^{1a}: There is no significant difference in Group I in the number of district cooperators who have positive attitudes toward wildlife and those who have negative attitudes toward wildlife.

H_o^{1b}: There is no significant difference in Group II in the number of district cooperators who have positive attitudes toward wildlife and those who have negative attitudes toward wildlife.

H_o^{1c}: There is no significant difference between Group I and Group II in the number of district

cooperators who have positive attitudes toward wildlife and those which have negative attitudes toward wildlife.

H_o^{1d}: There is no significant difference in the mean of the attitude scores between Group I and Group II.

Method of Handling Data:

H_o^{1} = chi-square

H_o^{1a} = chi-square

H_o^{1b} = chi-square

H_o^{1c} = chi-square

H_o^{1d} = Students T-test

Research Objective #2:

Using a simple model based on the diversity assumption (Miranowski and Bender, 1982) to determine the potential condition of the district cooperators agricultural properties relative to wildlife habitat.

Source of Data:

Survey questions one through six and the answer from column number one of question 17 were used as the source of these data (Appendix A).

Null Hypotheses:

H_o^{2}: There is no significant difference in the number of agricultural properties in the study which have a higher diversity rating for wildlife and those which have a lower diversity rating.

H_o^{2a}: There is no significant difference in the number of agricultural properties in Group I which have a higher diversity rating for wildlife and those which have a lower diversity rating.

H_o^{2b}: There is no significant difference in the number of agricultural properties in Group II which have a higher diversity rating for wildlife and those which have a lower diversity rating.

H_o^{2c}: There is no significant difference between Group I and Group II in the number of agricultural properties which have a higher diversity rating for wildlife and those which have a lower diversity rating.

H_o^{2d}: There is no significant difference in the mean of question number one scores between Group I and Group II.

Method of Handling Data:

H_o^{2} = chi-square

H_o^{2a} = chi-square

H_o^{2b} = chi-square

H_o^{2c} = chi-square

H_o^{2d} = Students T-test

Research Objective #3:

To determine how the expressed attitude of district cooperators concerning wildlife/wildlife habitat correlates with the condition of their property reflected by its diversity rating.

Source of Data:

Comparison of survey question #20 to questions one through six, and the answer from column number one of question #17 were used as the source of these data (Appendix A).

Null Hypotheses:

H_o^{3}: There is no positive correlation between the attitudes expressed by district cooperators in the study and the diversity rating of their property.

H_o^{3a}: There is no positive correlation between attitudes expressed by Group I district cooperators and the diversity rating of their property.

H_o^{3b}: There is no positive correlation between attitudes expressed by Group II district cooperators and the diversity rating of their property.

Method of Handling Data:

H_o^{3} = Pearson Product Moment Coefficient of Correlation

H_o^{3a} = Pearson Product Moment Coefficient of Correlation

H_o^{3b} = Pearson Product Moment Coefficient of Correlation

Research Objective #4:

To identify the characteristics of a conservation agency assistance program which influence participation in the program.

Source of Data:

Survey question number 11 and the frequency of occurrence as first, second and third choice of items in question number 12 (Appendix A).

Research Questions:

1. Are there characteristics of a conservation agency assistance program which are more preferred by district cooperators in the study?

2. Are there characteristics of a conservation agency assistance program which are more preferred by district cooperators in Group I?

3. Are there characteristics of a conservation agency assistance program which are more preferred by district cooperators in Group II?

Method of Handling Data:

Question 1 = rank mean scores of question 11, whole group, and frequency of occurrence, question 12.

Question 2 = rank mean scores of question 11, Group I, and frequency of occurrence, question 12.

Question 3 = rank mean scores of question 11, Group II, and frequency of occurrence, question 12.

Research Objective #5

To identify acceptable components for a habitat assistance program for district cooperators in the study.

Source of Data:

Survey question number 15 and the frequency of occurrence as first or second choice of items in question number 16 (Appendix A).

Research Questions:

1. Are there program components which are more acceptable than others to district cooperators in the study?

2. Are there program components which are more acceptable than others to district cooperators in Group I?

3. Are there program components which are more acceptable than others to district cooperators in Group II?

4. Are there program components which are more acceptable than others to district cooperators in Group I than to district cooperators in Group II?

Method of Handling Data:

Question 1 = rank mean scores of whole group, question 15; frequency of occurrence, question 16.

Question 2 = rank mean scores of Group I, question 15; frequency of occurrence, question 16.

Question 3 = rank mean scores of Group II, question 15; frequency of occurrence, question 16.

Question 4 = compare lists of ranked means of Group I and Group II, question 15; frequency of occurrence, question 16.

Research Objective #6:

To determine the willingness of district cooperators in the study to use each of the 13 soil and wildlife conservation practices.

Source of Data:

Survey question number 17 was the source of information of this data (Appendix A).

Null Hypotheses:

H_o^6: No significant difference exists in the willingness to use each of the 13 soil and wildlife conservation practices by district cooperators in Group I than by district cooperators in Group II.

H_o^{6a}: No significant difference exists between those Group I cooperators who live west of Interstate 35 (I-35) and Group I cooperators who live east of I-35 in their willingness to use each of the

13 soil and wildlife conservation practices.

H_o^{6b}: No significant difference exists between those Group II district cooperators who live west of I-35 and Group II district cooperators who live east of I-35 in their willingness to use each of the 13 soil and wildlife conservation practices.

H_o^{6c}: No significant difference exists in the willingness to use each of the 13 soil and wildlife conservation practices between district cooperators who live east of I-35 and district cooperators who live west of I-35.

Method of Handling Data:

H_o^{6} = chi-square

H_o^{6a} = chi-square

H_o^{6b} = chi-square

H_o^{6c} = chi-square

Research Objective #7:

To determine if differences exist between Group I and Group II in this study for selected demographic characteristics.

Source of Data:

Survey questions 23, 24, 25, 27, 29, 30, 32, 33, 37, 39, and 43 were the source of this data (Appendix A).

Null Hypothesis:

H_o^{7}: There is no significant difference between the district cooperators in Group I and the district cooperators in Group II for the demographic/socioeconomic variables identified in questions 23, 24, 25, 27, 29, 30, 32, 33, 37, 39, and 43 in the survey.

Method of Handling Data:

H_o^{7}:
Question 23 = chi-square
Question 24 = chi-square
Question 25 = chi-square
Question 27 = chi-square
Question 29 = chi-square
Question 30 = chi-square
Question 32 = chi-square
Question 33 = chi-square

Question 37 = chi-square
Question 39 = chi-square
Question 43 = chi-square

CHAPTER IV

FINDINGS

Introduction

The findings presented here are organized around the individual Research Objectives. For objectives 1, 2, 4, 5, and 6 the findings are presented for the population as a whole, within Group I, within Group II, and between Groups. Differences between groupings east and west of Interstate 35 are also considered for Objective 6. Objective 3 considers correlations within the population as a whole, within Group I and within Group II. Finally, Objective 7 presents a comparison on selected demographic responses between Group I and Group II.

The basis for examination of the population in the study and the comparison of Groups I and II in the population were attitudinal and preferential responses, responses to statements concerning current land use practices, and socioeconomic/demographic characteristics. The attitudinal responses focused on the attitude of the respondent toward wildlife and wildlife habitat. The preferential responses focused on the respondents' preferences for

program components and selected soil and wildlife practices. The socioeconomic/demographic characteristics on which the two groups were compared included growing up on a farm or ranch, age, education, number of years farming/ranching, number of years as a district cooperator, current farm tenure, amount of farm labor provided by the landowner and his family, percent of total income derived from farming, size of operation, and type of operation. Only that data relating to significant findings is reported in this study. The interpretive remarks which accompany the presentation of the findings are the opinions and impressions of the author.

Findings and Discussion

Cooperator Attitudes

Research Objective 1 was, using an attitude scale, to determine the positive or negative nature of the attitude of district cooperators in the study toward wildlife and wildlife habitat. Research Objective 1 was met through the testing of five null hypotheses. The expected values for the one sample chi-squares were set at 75 percent/25 percent, positive and negative based on the positive nature of the information on attitudes in previous studies (Sheriff et al., 1981; Sebert, 1982). Table 1 displays the chi-square values for hypotheses H_o^1 through H_o^{1c}, the T-test value for H_o^{1d}, and measures of central tendency for the attitude

TABLE I

CHI SQUARE VALUES FOR ATTITUDE SCORES, SURVEY QUESTION 20, RESEARCH OBJECTIVE 1

	N	x^2	df	p
H_o^1	407	77.57	1	($p < .001$)
H_o^{1a}	216	45.65	1	($p < .001$)
H_o^{1b}	191	31.98	1	($p < .001$)
H_o^{1c}	407	0.083	1	$p = .77$

T-TEST FOR MEAN ATTITUDE SCORES, GROUP I AND GROUP II

	N	mean	t	p
H_o^{1d}				
Group I	215	28.64	0.046	0.9633
Group II	189	28.62		

MEASURES OF CENTRAL TENDENCY FOR ATTITUDE SCORES, QUESTION 20

	mean	mode	median
Group I & II	28.6	31	29
Group I	28.6	31	29
Group II	28.6	29	29

scores.

Hypotheses H_o^1, H_o^{1a}, and H_o^{1b} were rejected indicating significant differences do exist in the proportion of district cooperators in the study who have positive attitudes toward wildlife and those who have negative attitudes toward wildlife.

Hypotheses H_o^{1c} and H_o^{1d} were not rejected, indicating there is no significant difference between Group I and Group II in the proportion of district cooperators who have positive attitudes toward wildlife and those who have negative attitudes toward wildlife. In addition there is no significant difference in the mean attitude scores for the two groups. Other measures of central tendency for the entire populations and sub groups I and II are further evidence of the lack of significant difference in cooperator attitudes toward wildlife (Table I). Among district cooperators, attitudes as reflected by the scores from survey question 20 are positive. For the entire sample, 61 percent strongly agreed that seeing wildlife around the farm was very important to them, and another 36 percent indicated they agreed with the same statement, and only 6 percent of the respondents did not want wildlife on their land. While this high percentage expressed a positive attitude, more than 85 percent indicated they agreed to some degree with the statement regarding farmers who enjoy wildlife sometimes choose economic gains over maintaining habitat. In

addition, almost 42 percent of the respondents reflected some degree of awareness when they indicated they felt changes in farming had affected wildlife numbers. For the entire population, almost three quarters indicated they try to consider wildlife habitat when they make a land use decision.

Potential of Agricultural Properties for Wildlife

Research Objective 2 was, using a simple model based on the diversity assumption (Miranowski and Bender, 1982), to determine the potential condition of the district cooperators agricultural properties relative to wildlife habitat. Research Objective 2 was met through the testing of five null hypotheses. The expected values for the one sample chi-squares were set at 75 percent/25 percent, high and low based on the positive nature of the relationship between conservation farming and wildlife (USDA-SCS, 1984; Great Plains Agricultural Council, 1984). Table II displays the chi-square values for Hypotheses H_o^2 through H_o^{2c}, the t value for H_o^{2d}, and the measures of central tendency for the diversity rating score. Hypotheses H^2, H_o^{2a}, and H_o^{2b} were rejected, indicating significant differences do exist in the proportion of agricultural properties in the study which have a positive diversity rating and those which have a negative diversity rating.

TABLE II

CHI SQUARE VALUES FOR POTENTIAL CONDITION OF PROPERTY RELATIVE TO WILDLIFE HABITAT, SURVEY QUESTION 1, RESEARCH OBJECTIVE 2

H_o	N	x^2	df	p
H_o^2	407	87.97	1	($p < .001$)
H_o^{2a}	216	41.51	1	($p < .001$)
H_o^{2b}	191	46.62	1	($p < .001$)
H_o^{2c}	407	1.20	1	$p = .2730$

SURVEY QUESTION 1 t-TEST
MEAN

	N	mean	t	p
H_o^{2d}				
Group I	216	59.49	-1.76	$p = .0795$
Group II	191	61.38		

MEASURES OF CENTRAL TENDENCY FOR DIVERSITY RATING SCORES
SURVEY QUESTION 1

	mean	mode	median
Group I & II	60.4	63	61
Group I	59.5	63	60.5
Group II	61.4	68	62

H_o^{2c} and H_o^{2d} were not rejected, which indicates that no differences exist between Group I and Group II for the proportion of properties which have a positive diversity rating and those which have a negative diversity rating. In addition there is no significant difference in the mean scores for diversity rating between Group I and Group II. Other measures of central tendency for the entire population and sub groups I and II are further evidence of the lack of significant difference in the diversity rating scores for the properties owned by cooperators in the study.

The source of the data for Research Objective 2 was a weighted score derived from survey questions 1 through 6 and any item circled in column 1, question 17. An analysis of survey question 1 responses revealed some general information about the property in the study. In the last ten years field size has been increasing and there has been little activity relative to windbreaks on the properties in the study. For the entire population, about 83 percent reported removing no windbreaks and 76 percent had not planted any windbreaks on their land. The data indicate that 74 percent of the cooperators in the study mow their roadsides regularly. A large percent of the cooperators leave odd areas in natural vegetation. Over the last ten years two thirds of the population have not removed vegetation and trees along creek banks.

Information concerning conversion of land from one

agricultural use to another was also gathered in question 1. Woodland had been converted completely to pasture by 7 percent of the population and 27 percent had converted some woodland to pasture. Rangeland had been converted to pasture by almost one third of the population. Rangeland had been converted to cropland by 12 percent and about 50 percent had converted cropland to pasture some time in the last ten years.

A chi-square analysis by item did yield significant differences within the study population. The responses for survey question 2 yielded a significant chi-square value. Question 2 dealt with the primary method of tillage used by the cooperator (Table III). The greatest contribution to the chi-square value was the response, "minimum tillage". Group I responded more frequently than expected; Group II, less frequently. It is probable that this difference could be attributed to two factors. Minimum tillage techniques are a relatively new innovation and are appropriate for use on only certain types of cropland. The members of Group II tend to be older and adoption research has shown that age does appear to influence adoption rates (Lovejoy and Parent, 1981, Ervin and Ervin, 1982, and Choi and Coughenour, 1979). It is also possible that fewer cooperators in Group II may be involved in cropping systems on land which makes minimum tillage techniques a viable alternative.

A chi-square analysis of survey question 4 also proved

TABLE III

CONTINGENCY TABLE, ENTIRE POPULATION, COOPERATORS
PRIMARY METHOD OF TILLAGE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	1	2	3	4	TOTAL
COOPERATORS	50	48	61	41	16	166
	.	42.4	71.6	31.3	20.7	
	.	0.7	1.6	3.0	1.1	
	.	14.59	18.54	12.46	4.86	50.46
	.	28.92	36.75	24.70	9 64	
	.	57.14	42.96	66.13	39.02	
DIRECTORS	28	36	81	21	25	163
	.	41 6	70.4	30.7	20.3	
	.	0.8	1.6	3.1	1.1	
	.	10.94	24.62	6.38	7.60	49.54
	.	22.09	49.69	12.88	15 34	
	.	42.86	57.04	33.87	60.98	
TOTAL	.	84	142	62	41	329
	.	25.53	43.16	18 84	12.46	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	12.932	DF= 3	PROB=0.0048
PHI	0.198		
CONTINGENCY COEFFICIENT	0.194		
CRAMER'S V	0.198		
LIKELIHOOD RATIO CHISQUARE	13.079	DF= 3	PROB=0.0045

Key: Cooperators = Group I
Directors = Group II

Key: 1 = moldboard plow
2 = stubble mulching
3 = no till/minimum till
4 = other

significant. Question 4 dealt with grazing practices and the regularity with which cooperators removed more than 50 percent of the annual growth from their pastures (Table IV). The greatest contribution to the chi-square value was the response, "always". Group I responded more frequently than expected; Group II less frequently. This relationship may be due to the differences in the size of holdings. Group II cooperators tend to have larger holdings which may allow them more options for rotational grazing. This relationship also could be attributable to the economic well-being of the cooperator. Directors (Group II) tend to be relatively secure economically.

The responses for survey question 6 also yielded a significant chi-square value (Table V). Question 6 asked respondents if improving or maintaining wildlife habitat was included in their conservation plan. The greatest contribution to the chi-square value was the response, "no". Group I responded that maintaining and improving wildlife habitat was not part of their conservation plan more frequently than expected. Group II responded less frequently than expected. As there is no significant difference in attitude scores between groups, the significant difference displayed on question 6 may be attributable to the fact that district directors (Group II) have more contact with the personnel who supply planning and technical assistance to landowners. Other results indicate that this type of assistance is more

TABLE IV

CONTINGENCY TABLE, ENTIRE POPULATION, COOPERATORS WHO REMOVE MORE THAN 50% OF GROWTH ON PASTURE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALWAYS	MOST OF TIME	SELDOM	NEVER	DOES NOT APPLY	TOTAL
COOPERATORS	4	31	99	53	17	12	212
	.	22.0	105.2	59.6	15.6	9.7	
	.	3.7	0.4	0.7	0.1	0.6	
	.	7.85	25.06	13.42	4.30	3.04	53.67
	.	14.62	46.70	25.00	8.02	5.66	
	.	75.61	50.51	47.75	58.62	66.67	
DIRECTORS	8	10	97	58	12	6	183
	.	19.0	90 8	51.4	13.4	8.3	
	.	4.3	0.4	0.8	0.2	0.7	
	.	2.53	24.56	14.68	3 04	1.52	46.33
	.	5.46	53.01	31.69	6.56	3.28	
	.	24.39	49.49	52.25	41.38	33.33	
TOTAL	.	41	196	111	29	18	395
	.	10.38	49.62	28.10	7.34	4.56	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	11.798	DF= 4	PROB=0.0189
PHI	0.173		
CONTINGENCY COEFFICIENT	0.170		
CRAMER'S V	0.173		
LIKELIHOOD RATIO CHISQUARE	12.304	DF= 4	PROB=0.0152

Key: Cooperators = Group I
Directors = Group II

TABLE V

CONTINGENCY TABLE, ENTIRE POPULATION, COOPERATORS WHO HAVE INCLUDED IMPROVING/MAINTAINING WILDLIFE HABITAT AS PART OF THEIR CONSERVATION PLAN

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	YES	NO	TOTAL
COOPERATORS	21	126	69	195
	.	143.2	51.8	
	.	2.1	5.7	
	.	33.78	18.50	52.28
	.	64.62	35.38	
	.	45.99	69.70	
DIRECTORS	13	148	30	178
	.	130.8	47.2	
	.	2.3	6.3	
	.	39.68	8.04	47.72
	.	83.15	16.85	
	.	54.01	30.30	
TOTAL	.	274	99	373
	.	73.46	26.54	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	16.389	DF= 1	PROB=0.0001
PHI	-0.210		
CONTINGENCY COEFFICIENT	0.205		
CRAMER'S V	0.210		
LIKELIHOOD RATIO CHISQUARE	16.781	DF= 1	PROB=0.0001
CONTINUITY ADJ. CHI-SQUARE	15.453	DF= 1	PROB=0.0001
FISHER'S EXACT TEST (1-TAIL)			PROB=0.0000
(2-TAIL)			PROB=0.0001

Key: Cooperators = Group I
Directors = Group II

highly valued by Group II cooperators. Conceivably this could result in a broader, more inclusive plan for Group II cooperators.

An item analysis by chi-square of survey question 17 was conducted to meet Research Objective 6. However, items the respondent circled in column 1 were added to the diversity rating for Research Objective 2. The only item from question 17 which yielded a significant chi-square value which appeared to be based on the cell loadings representing column 1 was part (i). Cell loadings indicate that 22 Group I respondents were already fencing farm ponds compared to 9 for Group II. The promotion of fencing farm ponds as a wildlife /soil conservation measure is a relative new innovation in Oklahoma. Two factors which could be involved are the influence of age on adoption rates and the landowner's perception of the practice as it contributes to his production goals. Fencing a farm pond is not a highly production oriented practice and the conservation benefits may not be readily apparent to cooperators. The practice also calls for an outlay of materials and requires a conscious effort to provide an alternate watering site below the dam. This practice, along with freeze proof tanks, has only recently been targeted for promotion.

For question 17, column 1, the first column represented the response "already using". The percentage of the total responses which fall into column 1, survey question 17,

items (a) through (m) is shown in Table VI. For the entire population, practices which are more compatible with agricultural production show a higher percentage of use.

Survey question 2 indicates that stubble mulching was the most widely used method of tillage by the study group. The moldboard plow was used by one fourth of the respondents and almost 20 percent of the respondents used minimum tillage techniques.

Grazing practices are assessed by survey questions 3, 4, and 5. For those who have rangeland, 6 percent always remove more than 50 percent of the annual growth. Of those cooperators who have rangeland, one third remove more than 50 percent most of the time. On pastureland, percentages for removing more than 50 percent of the annual growth all or most of the time are 10 percent and 49 percent, respectively. Of those who graze their woodlands, almost 31 percent indicated they always graze their woodlands and one fourth graze their woodlands most of the time.

Attitude and Condition of Holdings

Research Objective 3 was to determine how the expressed attitude of district cooperators concerning wildlife/wildlife habitat correlated with the condition of their property as reflected by its diversity rating. Research Objective 3 was met through the testing of three null hypotheses. Hypotheses H_o^3 through H_o^{3b} were tested using

TABLE VI

PERCENT OF ENTIRE POPULATION ALREADY USING SELECTED SOIL AND WILDLIFE PRACTICES

Item	Percent already using practice
a - native grasses	22.86
b - retain woodlots	40.66
c - protect wetlands	14.58
d - land revert	17.39
e - plant food plots	16.71
f - leave grain	5.38
g - restrict grazing on wooded areas	13.25
h - plant trees and shrubs	15.80
i - fence ponds	8.05
j - leave 50% growth	20.05
k - overseed legumes	28.42
l - control burn	27.51
m - manage brush to leave cover	29.55

the Pearson Product Moment Coefficient of Correlation statistic. All of the hypotheses for Research Objective 3 were rejected, indicating statistically significant relationships on all three comparisons. The Pearson Product Moment Correlation values for H_o^3 through H_o^{3b} were .36 ($p < 0.0001$), .32 ($p < 0.0001$), and .42 ($p < 0.0001$), respectively. Pearson Product Moment coefficients of correlation can range from -1 to +1, and the greater the absolute value the more pronounced the relationship, be it positive or negative. The value needed for statistical significance is affected by the number of paired scores used in the computation. The number of paired scores in this study was 407. The coefficients demonstrate a modest relationship between attitude and condition of place. The relationships account for about 10 to 15 percent of the variance in the scores.

Characteristics of Assistance Programs

Research Objective 4 was to identify the characteristics of a conservation agency assistance program which influence participation in the program. Four research questions were answered by examining the mean scores from items (a) through (h) from survey question 11, which dealt with importance of assistance program characteristics to cooperators. Means were ranked from high to low for the entire population, Group I, and Group II (Table VII). Frequency counts from survey question 12 can be compared to

TABLE VII

CHARACTERISTICS OF CONSERVATION AGENCY ASSISTANCE PROGRAMS (QUESTION 11) RANKED BY MEAN SCORES OBJECTIVE 4

Rank	Entire Population		Group I		Group II	
1	f	4.68	f	4.64	f	4.74
2	d	4.36	d	4.47	a	4.28
3	a	4.19	a	4.11	d	4.23
4	e	4.12	e	4.09	b	4.20
5	g	4.05	c	4.04	e	4.16
6	b	3.97	g	3.98	g	4.13
7	c	3.95	b	3.79	c	3.82
8	h	3.68	h	3.58	h	3.79

KEY
a = Compatibility
b = Technical Assistance
c = Cost-sharing Practices
d = Cost to You
e = Profitability
f = Control Soil Erosion
g = Improving Water Quality
h = Planning Assistance

the list of characteristics ranked by mean in Table VII. To obtain supporting data question 12 offered respondents the opportunity to indicate their first, second, and third choices for most important program characteristics (Table VIII). An examination of Table VII reveals that differences in the importance of several program characteristics exist. Control of erosion, cost, compatibility and profitability rank relatively high for Groups I and II. There is some disparity between groups in the importance of technical assistance and availability of cost share.

The data from question 12 reinforce the idea that while conservation is important, economics are closely tied to a cooperator's decisions and involvement in programs and practices. While controlling erosion was the most important characteristic (first choice, question 12) economic elements (cost share, profitability, and cost to you) rank close behind.

An item analysis of survey question 11 yielded only one significant chi-square value (Table IX). The greatest contributions to the chi-square value were the responses, "less important" and "not important". Group I responded more frequently than expected that availability of technical assistance was less or not important and Group II responded less frequently than expected. This indication that availability of technical assistance is more important to Group II cooperators as a program characteristic may be based on

TABLE VIII

CHARACTERISTICS OF CONSERVATION AGENCY ASSISTANCE PROGRAMS (QUESTION 11) RANKED BY PERCENT OF FREQUENCY

A. AS FIRST CHOICE QUESTION 12

Rank	Entire Population		Group I		Group II	
1	f	27.13	f	26.09	f	28.33
2	d	19.38	d	24.15	e	17.78
3	c	14.21	c	20.29	a	17.20
4	a	13.95	a	11.11	d	13.89
5	e	12.92	e	8.70	b	8.33
6	b	6.98	b	5.80	c	7.22
7	g	2.84	g,h	1.93*	g	3.89
8	h	2.58			h	3.33
PERCENT		100.00		100.00		100.00

B. AS SECOND CHOICE QUESTION 12

Rank	Entire Population		Group I		Group II	
1	d	21.19	d	27.18	f	23.76
2	f	19.12	e	18.45	b	17.13
3	e	17.05	c,f	15.05*	e	15.47
4	b	13.18	b	9.91	d	14.36
5	c	12.66	g	6.31	a,c	9.94*
6	a	7.75	a	5.83	g	8.84
7	g	7.49	h	2.43	h	0.55
8	h	1.55				
PERCENT		100.00		100.00		100.00

C. AS THIRD CHOICE QUESTION 12

Rank	Entire Population		Group I		Group II	
1	f	24.87	f	22.66	f	27.37
2	c,d	12.57*	e	16.26	d	15.64
3	e	12.30	c,g	12.81*	c	12.39
4	g	11.78	b	11.33	b	11.73
5	b	11.52	d	9.95	g	10.61
6	h	7.33	a	7.88	h	9.38
7	a	7.07	h	6.40	e	7.82
8					a	6.15
PERCENT		100.00		100.00		100.00

Key to Table VIII

a = Compatibility
b = Technical Assistance
c = Cost-sharing Practices
d = Cost to You
e = Profitability
f = Control Erosion
g = Improve Water Quality
h = Planning Assistance

* = exhibited the same percent

TABLE IX

CONTINGENCY TABLE, ENTIRE POPULATION, IMPORTANCE OF AVAILABILITY OF TECHNICAL ASSISTANCE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		VERY IMPORTANT	IMPORTANT	LESS IMPORTANT	NOT IMPORTANT	UNDECIDED	TOTAL
COOPERATORS	7	59	102	34	11	3	209
	.	69.1	105.3	25.9	7.0	1.6	
	.	1.5	0.1	2.5	2.3	1.2	
	.	15.25	26.36	8.79	2.84	0.78	54.01
	.	28.23	48.80	16.27	5.26	1.44	
	.	46.09	52.31	70.83	84.62	100.00	
DIRECTORS	13	69	93	14	2	0	178
	.	58.9	89.7	22.1	6.0	1.4	
	.	1.7	0.1	3.0	2.6	1.4	
	.	17.83	24.03	3.62	0.52	0.00	45.99
	.	38.76	52.25	7.87	1.12	0.00	
	.	53.91	47.69	29.17	15.38	0.00	
TOTAL	.	128	195	48	13	3	387
	.	33.07	50.39	12.40	3.36	0.78	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	16.383	DF= 4	PROB=0.0025
PHI	0.206		
CONTINGENCY COEFFICIENT	0.202		
CRAMER'S V	0.206		
LIKELIHOOD RATIO CHISQUARE	18.323	DF= 4	PROB=0.0011

Key: Cooperators = Group I
Directors = Group II

the extended personal contact the directors (Group II) have with SCS personnel who supply technical assistance.

Preferred Habitat Assitance Program Components

Research Objective 5 was to identify acceptable components for a habitat assistance program for district cooperators in the study. The four research questions were answered by examining the mean scores from items (a) through (g) from survey question 15, which dealt with the cooperators likeliness to use the habitat assistance program components specified in question 15. Means were ranked from high to low for the entire population, Group I, and Group II (Table X).

Frequency counts from survey question 16 can also be compared to the list of preferred types of assistance ranked by mean in Table X. Question 16 offered respondents the opportunity to indicate their first and second choices for most preferred type of assistance (Table XI). Better trespass laws and increased law enforcement rank high with both groups as preferred types of assistance. These findings are supported by the findings of other studies (ODWC, 1984; Sebert, 1982). Improper public access is a major problem to private landowners and a very real deterrent to habitat improvement.

A further analysis of survey question 15 by chi-square revealed two items with significant chi-square values, item

TABLE X

TYPES OF HABITAT PROGRAM ASSISTANCE COOPERATORS WOULD BE MOST LIKELY TO USE RANKED BY MEAN BY GROUP OBJECTIVE 5

Rank	Entire Population		Group I		Group II	
1	e	3.22	e	3.25	e	3.18
2	f	3.04	f	3.08	f	2.99
3	a	2.92	a	3.04	b	2.90
4	b	2.89	d	2.92	d	2.80
5	d	2.86	b,c	2.87*	a	2.78
6	c	2.74	g	2.70	g	2.73
7	g	2.71			c	2.59
PERCENT		100.00		100.00		100.00

KEY
a = Free/low cost plant materials
b = Technical assistance
c = Cash payments
d = Tax breaks
e = Better trespass laws
f = Increased law enforcement
g = Farm/ranch wildlife specialists

* = exhibited the same percent

TABLE XI

TYPES OF HABITAT PROGRAM ASSISTANCE COOPERATORS WOULD BE MOST LIKELY TO USE RANKED BY PERCENT OF FREQUENCY

A. AS FIRST CHOICE QUESTION 16, OBJECTIVE 5

Rank	Entire Population	Group I	Group II
1	e 27.85	a 28.44	e 27.72
2	a 22.03	e 27.96	c 19.57
3	c 19.24	c 18.96	b 16.85
4	b 12.66	b 9.00	a 14.67
5	d 9.11	d 8.53	d 9.78
6	f 7.34	f 6.16	f 8.70
7	g 1.77	g 0.95	g 2.72
PERCENT	100.00	100.00	100.00

B. AS SECOND CHOICE QUESTION 16, OBJECTIVE 5

Rank	Entire Population	Group I	Group II
1	f 21.17	f 21.15	f 21.20
2	e 18.88	e 17.79	e 20.11
3	d 17.60	c,d 16.35*	d 19.02
4	c 12.24	g 11.06	g 12.50
5	g 11.73	a,b 8.65*	b 11.41
6	b 9.95		a 8.15
7	a 8.42		c 7.61
PERCENT	100.00	100.00	100.00

KEY a = Free/low cost plant materials
b = Technical assistance
c = Cash payments
d = Tax breaks
e = Better trespass laws
f = Increased law enforcement
g = Farm/ranch wildlife specialists

* = exhibited the same percent

(a) and item (c)(Table XII and Table XIII). Each of these items dealt with the acceptance of some type of free materials or monetary assistance for cooperators. For item (a), concerning the respondent's likeliness to use free or low cost plant materials as a type of habitat improvement assistance, the response "very likely" made the greatest contribution to the chi-square value. Responses indicate that more Group I cooperators were very likely to use free/low cost plant materials than expected and fewer Group II cooperators than expected indicated that they were very likely to use free/low cost plant materials.

Item (c) dealt with direct cash payments for maintenance of wildlife land. The response, "very likely" also makes the greatest contribution to the chi-square value for item (c). The same relationship for item (a) for Group I and II exists for item (c). These responses indicate a trend that Group II (directors) are less inclined to accept cash or free materials as types of assistance. It is the author's opinion that these differences probably stem from the reluctance of district directors (Group II) in their leadership role to accept types of assistance in which they are actually paid money or given materials of value at no charge. Many times directors are long time cooperators and have already completed their conservation plan by the time they become a director. They are usually relatively secure financially and many times tend to forego cost share funds.

TABLE XII

CONTINGENCY TABLE, ENTIRE POPULATION, PREFERRED TYPE OF ASSISTANCE--FREE/LOW COST SEED/PLANT MATERIALS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	. .	VERY LIKELY	LIKELY	LESS LIKELY	NOT LIKELY	TOTAL
COOPERATORS	5	81	79	30	21	211
	.	65.5	86.9	35.2	23.4	
	.	3.6	0.7	0.8	0.3	
	.	20.45	19.95	7.58	5 30	53.28
	.	38.39	37.44	14.22	9.95	
	.	65.85	48.47	45.45	47.73	
DIRECTORS	6	42	84	36	23	185
	.	57.5	76.1	30 8	20 6	
	.	4.2	0.8	0.9	0.3	
	.	10.61	21.21	9.09	5 81	46.72
	.	22.70	45.41	19.46	12.43	
	.	34.15	51.53	54.55	52.27	
TOTAL	.	123	163	66	44	396
	.	31.06	41.16	16.67	11.11	100 00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	11.498	DF= 3	PROB=0.0093
PHI	0.170		
CONTINGENCY COEFFICIENT	0.168		
CRAMER'S V	0.170		
LIKELIHOOD RATIO CHISQUARE	11.664	DF= 3	PROB=0.0086

Key: Cooperators = Group I
Directors = Group II

TABLE XIII

CONTINGENCY TABLE, ENTIRE POPULATION, PREFERRED TYPE OF ASSISTANCE--CASH FOR MAINTAINING WILDLIFE LAND

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	. .	VERY LIKELY	LIKELY	LESS LIKELY	NOT LIKELY	TOTAL
COOPERATORS	2	80	61	37	36	214
	.	65.6	65.6	44.4	38.5	
	.	3.2	0.3	1.2	0.2	
	.	20.25	15.44	9.37	9.11	54.18
	.	37.38	28.50	17.29	16.82	
	.	66.12	50.41	45.12	50.70	
DIRECTORS	10	41	60	45	35	181
	.	55.4	55.4	37.6	32.5	
	.	3.8	0.4	1.5	0.2	
	.	10.38	15.19	11.39	8.86	45.82
	.	22.65	33.15	24 86	19 34	
	.	33.88	49.59	54.88	49.30	
TOTAL	.	121	121	82	71	395
	.	30.63	30.63	20.76	17.97	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	10.691	DF= 3	PROB=0.0135
PHI	0.165		
CONTINGENCY COEFFICIENT	0.162		
CRAMER'S V	0.165		
LIKELIHOOD RATIO CHISQUARE	10.841	DF= 3	PROB=0.0126

Key: Cooperators = Group I
Directors = Group II

Cooperators' Willingness to Use Selected Soil/Wildlife Conservation Practices

Research Objective 6 was to determine the willingness to use each of the 13 selected soil and wildlife conservation practices for district cooperators in the study. Research Objective 6 was met through testing four null hypotheses. The responses to each of the 13 practices, items (a) through (m), were analyzed by Group I vs. Group II (H_o^6), within Group I east and west (H_o^{6a}), within Group II east and west (H_o^{6b}), and the entire population was analyzed east vs. west (H_o^{6c}). For H_o^{6a} through H_o^{6c}, Interstate 35 served as a division point to split the responses into the categories of east and west. Table XIV displays the number of items that exhibited significant chi-square scores for each of the analyses by hypotheses. All four null hypotheses for Research Objective 6 were rejected, indicating significant differences do exist in the willingness to use the 13 selected soil and wildlife conservation practices.

Each of the 13 practices from question 17 contribute to the enhancement of some habitat element. They have the potential to provide or improve some key element of habitat for wildlife throughout the year. The practices provide a variety of food, water, shelter and space options for wildlife. In combination with other cover types and ecological conditions they add to the diversity found on an operating unit.

TABLE XIV

NUMBER OF ITEMS COMPARED AND NUMBER FOUND SIGNIFICANT FOR EACH NULL HYPOTHESIS - OBJECTIVE 6

H_o	Number items compared	Number found significant
H_o^{6}	13	2
H_o^{6a}	13	11
H_o^{6b}	13	2
H_o^{6c}	13	10

In general much of the significance for these items appears attributable to category 3 (unwilling to use) and category 4 (does not apply) responses. From the responses it appears many practices are more applicable in a particular region of the state. In several instances, cooperators were less willing to use a practice that appeared best suited for their region. In general, cooperators were less willing to use practices that were perceived as less production oriented.

Group I vs. Group II

In an item analysis of survey question 17 for H_o^6, two items exhibited significant chi-square values: those items were (i) fencing ponds and (j) leave 50 percent annual growth on pastures (Tables XV through XVI). The largest contribution to the chi-square values for (i) fencing ponds comes from the response, "already using" with group I cooperators responding more frequently than expected.

The greatest contributions to the chi-square values for (j) are from the responses, "already using" and "unwilling to use". Group I cooperators responded less frequently than expected for "already using" and more frequently than expected for "unwilling to use". The relationship was reversed for the Group II cooperators - this indicates more Group II cooperators than expected are already leaving 50 percent annual growth and fewer than expected are unwilling

TABLE XV

CONTINGENCY TABLE, ENTIRE POPULATION, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--FENCE FARM PONDS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
COOPERATORS	13	22	54	97	30	203
	.	16.3	63.3	91.2	32.2	
	.	2.0	1.4	0.4	0.1	
	.	5.71	14.03	25.19	7.79	52.73
	.	10.84	26.60	47.78	14.78	
	.	70.97	45.00	56.07	49.18	
DIRECTORS	9	9	66	76	31	182
	.	14.7	56.7	81.8	28.8	
	.	2.2	1.5	0.4	0.2	
	.	2.34	17.14	19.74	8.05	47.27
	.	4.95	36.26	41.76	17.03	
	.	29.03	55.00	43.93	50.82	
TOTAL	.	31	120	173	61	385
	.	8.05	31.17	44.94	15.84	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	8.096	DF= 3	PROB=0.0441
PHI	0.145		
CONTINGENCY COEFFICIENT	0.144		
CRAMER'S V	0.145		
LIKELIHOOD RATIO CHISQUARE	8.252	DF= 3	PROB=0.0411

Key: Cooperators = Group I
Directors = Group II

TABLE XVI

CONTINGENCY TABLE, ENTIRE POPULATION, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--LEAVE 50% GROWTH ON PASTURE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
COOPERATORS	11	31	81	76	17	205
	.	41.1	84.8	63.8	15.3	
	.	2.5	0.2	2.3	0.2	
	.	7.97	20.82	19.54	4.37	52.70
	.	15.12	39.51	37.07	8.29	
	.	39.74	50.31	62.81	58.62	
DIRECTORS	7	47	80	45	12	184
	.	36.9	76.2	57.2	13.7	
	.	2.8	0.2	2.6	0.2	
	.	12.08	20.57	11.57	3.08	47.30
	.	25.54	43.48	24.46	6.52	
	.	60.26	49.69	37.19	41.38	
TOTAL	.	78	161	121	29	389
	.	20.05	41.39	31.11	7.46	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	10.991	DF= 3	PROB=0.0118
PHI	0.168		
CONTINGENCY COEFFICIENT	0.166		
CRAMER'S V	0.168		
LIKELIHOOD RATIO CHISQUARE	11.075	DF= 3	PROB=0.0113

Key: Cooperators - Group I
Directors - Group II

to do so. It is possible that this relationship is related to size of holdings. Directors tend to have larger holdings which may allow them more grazing management options. Larger holdings could permit directors to rotate grazing, leaving more growth on any specific pasture. Larger holdings could also offer opportunities for mixed grazing practices.

Group I East vs. Group I West

In an item analysis of survey question 17 for H_o^{6a}, Group I east compared to Group I west, 11 items exhibited significant chi-square values (Tables XVII through XXVII). The "does not apply" category makes the largest contribution to the chi-square value for item (a) (Table XVII) planting native grasses. Fewer Group I east cooperators than expected responded, and more Group I west cooperators than expected responded. This seems to indicate that the practice does not apply as well as in the west. The same "does not apply" relationship for Group I west exists for item (b) (Table XVIII), retaining existing woodlots and item (c) (Table XIX), protecting existing wetlands. Items (i) (Table XXIII) fencing farm ponds, (l) (Table XXVI) control burning to improve forage, and (m) (Table XXVII) managing brush also exhibit more responses than expected in the "does not apply" category for Group I west cooperators. With the exception of fencing farm ponds, each of these practices involve manipulation or utilization of some land type or vegetative

TABLE XVII

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--PLANT NATIVE GRASSES

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	2	24	54	15	11	104
	.	19.5	54.5	12.0	18.0	
	.	1.0	0.0	0.8	2.7	
	.	11.54	25.96	7.21	5.29	50.00
	.	23.08	51.92	14.42	10.58	
	.	61.54	49.54	62.50	30.56	
WEST	6	15	55	9	25	104
	.	19.5	54.5	12.0	18.0	
	.	1.0	0.0	0.8	2.7	
	.	7.21	26.44	4.33	12.02	50.00
	.	14.42	52.88	8.65	24.04	
	.	38.46	50.46	37.50	69.44	
TOTAL	.	39	109	24	36	208
	.	18.75	52.40	11.54	17.31	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	9.031	DF=	3	PROB=0.0289
PHI	0.208			
CONTINGENCY COEFFICIENT	0.204			
CRAMER'S V	0 208			
LIKELIHOOD RATIO CHISQUARE	9.212	DF=	3	PROB=0 0266

TABLE XVIII

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--RETAIN EXISTING WOODLOTS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	0	50	35	9	12	106
	.	41.9	33 8	6.1	24.2	
	.	1.6	0.0	1.4	6.2	
	.	23 81	16.67	4.29	5.71	50.48
	.	47.17	33.02	8.49	11.32	
	.	60.24	52.24	75.00	25.00	
WEST	6	33	32	3	36	104
	.	41.1	33.2	5.9	23.8	
	.	1.6	0.0	1.5	6.3	
	.	15.71	15.24	1.43	17.14	49.52
	.	31.73	30 77	2.88	34.62	
	.	39.76	47.76	25.00	75.00	
TOTAL	.	83	67	12	48	210
	.	39.52	31.90	5.71	22.86	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	18.599	DF= 3	PROB=0.0003
PHI	0.298		
CONTINGENCY COEFFICIENT	0.285		
CRAMER'S V	0.298		
LIKELIHOOD RATIO CHISQUARE	19.319	DF= 3	PROB=0.0002

TABLE XIX

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--PROTECT EXISTING WETLANDS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	2	16	33	11	44	104
		14.6	27.1	8.5	53.8	
		0.1	1.3	0.7	1.8	
		7.73	15.94	5.31	21 26	50.24
		15.38	31.73	10.58	42.31	
		55.17	61.11	64.71	41.12	
WEST	7	13	21	6	63	103
		14.4	26.9	8.5	53.2	
		0.1	1.3	0.7	1.8	
		6.28	10.14	2.90	30.43	49.76
		12.62	20.39	5.83	61.17	
		44.83	38.89	35.29	58.88	
TOTAL		29	54	17	107	207
		14.01	26.09	8.21	51.69	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	7.817	DF= 3	PROB=0.0500
PHI	0.194		
CONTINGENCY COEFFICIENT	0.191		
CRAMER'S V	0.194		
LIKELIHOOD RATIO CHISQUARE	7.879	DF= 3	PROB=0.0486

TABLE XX

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--LAND REVERT TO WILDLIFE HABITAT

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	2	18	28	47	11	104
	.	16.5	33.0	38.5	16.0	
	.	0.1	0.8	1.9	1.6	
	.	8.65	13.46	22.60	5.29	50.00
	.	17.31	26.92	45.19	10 58	
	.	54.55	42.42	61.04	34.38	
WEST	6	15	38	30	21	104
	.	16.5	33.0	38.5	16.0	
	.	0.1	0.8	1.9	1.6	
	.	7.21	18.27	14.42	10.10	50.00
	.	14.42	36.54	28.85	20.19	
	.	45.45	57.58	38.96	65.63	
TOTAL	.	33	66	77	32	208
	.	15.87	31.73	37.02	15.38	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	8.666	DF= 3	PROB=0.0341
PHI	0.204		
CONTINGENCY COEFFICIENT	0.200		
CRAMER'S V	0.204		
LIKELIHOOD RATIO CHISQUARE	8.756	DF= 3	PROB=0.0327

TABLE XXI

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES-LEAVE GRAIN FOR WINTER FOOD

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	2	5	30	30	39	104
	.	6.1	30.3	37.4	30.3	
	.	0.2	0.0	1.4	2.5	
	.	2.43	14.56	14.56	18.93	50.49
	.	4.81	28.85	28.85	37.50	
	.	41.67	50.00	40.54	65.00	
WEST	8	7	30	44	21	102
	.	5.9	29.7	36.6	29.7	
	.	0.2	0.0	1.5	2.6	
	.	3.40	14.56	21.36	10.19	49.51
	.	6.86	29.41	43.14	20.59	
	.	58.33	50.00	59.46	35.00	
TOTAL	.	12	60	74	60	206
	.	5.83	29.13	35.92	29.13	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	8.363	DF= 3	PROB=0.0391
PHI	0.201		
CONTINGENCY COEFFICIENT	0.198		
CRAMER'S V	0.201		
LIKELIHOOD RATIO CHISQUARE	8.464	DF= 3	PROB=0.0373

TABLE XXII

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--RESTRICT GRAZING WOODED AREAS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	4	13	32	43	14	102
	.	11.0	34.0	33.0	24.0	
	.	0.4	0.1	3.0	4.2	
	.	6.37	15.69	21.08	6.86	50.00
	.	12.75	31.37	42.16	13.73	
	.	59.09	47.06	65.15	29.17	
WEST	8	9	36	23	34	102
	.	11.0	34.0	33.0	24.0	
	.	0.4	0.1	3.0	4.2	
	.	4.41	17.65	11.27	16.67	50.00
	.	8.82	35.29	22.55	33 33	
	.	40.91	52.94	34.85	70.83	
TOTAL	.	22	68	66	48	204
	.	10.78	33.33	32.35	23.53	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	15.357	DF= 3	PROB=0.0015
PHI	0.274		
CONTINGENCY COEFFICIENT	0.265		
CRAMER'S V	0.274		
LIKELIHOOD RATIO CHISQUARE	15.717	DF= 3	PROB=0.0013

TABLE XXIII

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--FENCE FARM PONDS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	4	15	31	50	6	102
	.	11.1	27.1	48.7	15.1	
	.	1.4	0.6	0.0	5.5	
	.	7.39	15.27	24.63	2 96	50.25
	.	14.71	30.39	49.02	5.88	
	.	68.18	57.41	51.55	20 00	
WEST	9	7	23	47	24	101
	.	10.9	26.9	48.3	14.9	
	.	1.4	0.6	0.0	5.5	
	.	3.45	11.33	23.15	11.82	49.75
	.	6.93	22.77	46.53	23.76	
	.	31.82	42.59	48.45	80.00	
TOTAL	.	22	54	97	30	203
	.	10.84	26.60	47.78	14.78	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	14.982	DF= 3	PROB=0.0018
PHI	0.272		
CONTINGENCY COEFFICIENT	0.262		
CRAMER'S V	0.272		
LIKELIHOOD RATIO CHISQUARE	15.819	DF= 3	PROB=0.0012

TABLE XXIV

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--LEAVE 50% GROWTH ON PASTURE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	5	10	38	49	4	101
	.	15.3	39.9	37.4	8.4	
	.	1.8	0.1	3.6	2.3	
	.	4.88	18.54	23.90	1.95	49.27
	.	9.90	37.62	48.51	3.96	
	.	32.26	46.91	64.47	23.53	
WEST	6	21	43	27	13	104
	.	15.7	41.1	38.6	8.6	
	.	1.8	0.1	3.5	2.2	
	.	10.24	20.98	13.17	6.34	50.73
	.	20.19	41.35	25.96	12.50	
	.	67.74	53.09	35.53	76.47	
TOTAL	.	31	81	76	17	205
	.	15.12	39.51	37.07	8.29	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	15.304	DF= 3	PROB=0.0016
PHI	0.273		
CONTINGENCY COEFFICIENT	0.264		
CRAMER'S V	0.273		
LIKELIHOOD RATIO CHISQUARE	15.732	DF= 3	PROB=0.0013

TABLE XXV

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--OVERSEED LEGUMES IN PASTURE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	4	41	48	9	4	102
	.	25.3	50.0	14.4	12.4	
	.	9.8	0.1	2.0	5.7	
	.	19.90	23.30	4.37	1.94	49.51
	.	40.20	47.06	8.82	3.92	
	.	80.39	47.52	31.03	16.00	
WEST	6	10	53	20	21	104
	.	25.7	51.0	14.6	12.6	
	.	9.6	0.1	2.0	5.6	
	.	4.85	25.73	9.71	10.19	50.49
	.	9.62	50.96	19.23	20.19	
	.	19.61	52.48	68.97	84.00	
TOTAL	.	51	101	29	25	206
	.	24.76	49.03	14.08	12.14	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	34.807	DF=	3	PROB=0.0001
PHI	0.411			
CONTINGENCY COEFFICIENT	0.380			
CRAMER'S V	0.411			
LIKELIHOOD RATIO CHISQUARE	37.400	DF=	3	PROB=0.0001

TABLE XXVI

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--CONTROL BURN TO IMPROVE FORAGE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	4	31	50	15	6	102
	.	28.4	46.3	14.9	12.4	
	.	0.2	0.3	0.0	3.3	
	.	15.12	24.39	7.32	2.93	49.76
	.	30.39	49.02	14.71	5.88	
	.	54.39	53.76	50.00	24.00	
WEST	7	26	43	15	19	103
	.	28.6	46.7	15.1	12.6	
	.	0.2	0.3	0.0	3.3	
	.	12.68	20.98	7.32	9.27	50.24
	.	25.24	41.75	14.56	18.45	
	.	45.61	46.24	50.00	76.00	
TOTAL	.	57	93	30	25	205
	.	27.80	45.37	14.63	12.20	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	7.721	DF= 3	PROB=0.0521.
PHI	0.194		
CONTINGENCY COEFFICIENT	0.191		
CRAMER'S V	0.194		
LIKELIHOOD RATIO CHISQUARE	8.065	DF= 3	PROB=0.0447

TABLE XXVII

CONTINGENCY TABLE, GROUP I EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--MANAGE BRUSH TO LEAVE COVER

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
EAST	1	39	42	19	5	105
		30.9	42.8	17.4	13 9	
		2.2	0.0	0.1	5.7	
		18.48	19.91	9.00	2.37	49.76
		37.14	40.00	18.10	4.76	
		62.90	48.84	54.29	17.86	
WEST	4	23	44	16	23	106
		31.1	43.2	17.6	14.1	
		2.1	0.0	0.1	5.7	
		10.90	20.85	7.58	10.90	50.24
		21.70	41.51	15.09	21.70	
		37.10	51.16	45.71	82.14	
TOTAL		62	86	35	28	211
		29.38	40.76	16.59	13.27	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	16.000	DF= 3	PROB=0.0011
PHI	0.275		
CONTINGENCY COEFFICIENT	0.265		
CRAMER'S V	0.275		
LIKELIHOOD RATIO CHISQUARE	17.015	DF= 3	PROB=0.0007

type which is more predominant in the eastern half of Oklahoma. Burning has some application in the west but is not as applicable in a cash grain/livestock operation as it might be in a straight livestock operation. Most cooperators livestock operations in the western part of the state were cash grain/livestock operations.

Item (d) allowing land to revert to wildlife habitat, has two responses which make relatively large contributions to the chi-square value (Table XX). The "unwilling to use" and "does not apply" responses each contribute to significance. Fewer Group I west cooperators than expected were unwilling to use the practice and more than expected indicated the practice did not apply. More Group I east respondents than expected indicated they were unwilling to use the practice while fewer Group I east respondents than expected indicated the practice did not apply. Letting land revert to wildlife habitat is a very nonproduction oriented practice. The response indicates that it is not a popular idea. If promoted as a set aside or fallow program it might be more acceptable. It would be very difficult in the 1985 farm economy to realize wildlife benefits from long term set aside programs.

The same relationship exists for Group I east and Group I west respondents for item (g) restricted grazing on woodlands (Table XXII). This appears to indicate that more Group I east cooperators than expected are unwilling to use

practices that appear to be more applicable for use in the eastern part of the state. This unwillingness to restrict grazing on woodlands speaks to the influence of economics on the intensity of land use. Much of the eastern grazing land is interspersed with woodland and the expense to restrict grazing (fencing) and the reduction in total grazing acres may contribute to the eastern livestock owner's unwillingness to restrict grazing on his woodland.

The practice for item (f) (Table XXI) leaving 20' strips of grain next to field borders for winter wildlife food exhibited a relationship that is the reverse of the relationship described for items (d) letting land revert to wildlife habitat and (g) restricted grazing of woodlands. Group I east cooperators responded less frequently than expected for the "unwilling to use" response and more frequently than expected for the "does not apply" category. Group I west cooperators responded more frequently than expected for the "unwilling to use" response and less frequently than expected for the "does not apply" category. This appears to be another ecological/economic relationship. While more grain is grown in the west because of the suitability of the area for grain production, economic conditions probably make more western cooperators unwilling to use the practice. This practice is easily impacted by grain prices and economic conditions. It has been well received in areas where special campaigns and promotions have been

targeted. In these areas, cooperators have willingly participated in this practice.

The practice of leaving more than 50 percent annual growth on pasture and rangeland (j) has one response which makes a relatively large contribution to the chi-square value (Table XXIV). More Group I east cooperators than expected are unwilling to leave 50 percent of the annual growth on their pasture and more Group I west cooperators than expected were willing to use the practice. This difference may be attributable again to the greater number of grazing options available to the western cooperator.

The "already using" response for item (k) overseeding legumes in tame pasture, makes the greatest contribution to its chi-square value (Table XXV). More Group I east co-operators than expected are already using the practice.

Group II East vs. Group II West

In an item analysis of survey question 17 for H_o^{6b}, Group II east compared to Group II west, two items exhibited significant chi-square values. The chi-squares for question 17 item (b) and question 17 item (k) appear in Tables XXVIII and XXIX, respectively. The greatest contribution to the chi-square value for item (b) (Table XXVIII) retaining woodlots is from the "does not apply" response. Group II west cooperators responded more frequently than expected; Group II east less frequently. The practice is more

TABLE XXVIII

CONTINGENCY TABLE, GROUP II EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--RETAIN EXISTING WOODLOTS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	1	0	0	0	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	.
	.	.	.	.	.	
	.	.	.	.	.	
EAST	2	42	32	5	13	92
	.	38.3	27.4	5.0	21.4	
	.	0.4	0.8	0.0	3.3	
	.	22.70	17.30	2.70	7.03	49.73
	.	45.65	34.78	5.43	14.13	
	.	54.55	58.18	50.00	30.23	
WEST	3	35	23	5	30	93
	.	38.7	27.6	5.0	21.6	
	.	0.4	0.8	0.0	3.3	
	.	18.92	12.43	2.70	16.22	50.27
	.	37.63	24.73	5.38	32.26	
	.	45.45	41.82	50.00	69.77	
TOTAL	.	77	55	10	43	185
	.	41.62	29.73	5.41	23.24	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	8.825	DF= 3	PROB=0.0317
PHI	0.218		
CONTINGENCY COEFFICIENT	0.213		
CRAMER'S V	0.218		
LIKELIHOOD RATIO CHISQUARE	9.019	DF= 3	PROB=0.0290

TABLE XXIX

CONTINGENCY TABLE, GROUP II EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--OVERSEED LEGUMES IN PASTURE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	1	0	0	0	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
EAST	6	39	43	3	3	88
	.	28.4	43.0	7.3	9.3	
	.	4.0	0.0	2.6	4.3	
	.	21.67	23.89	1.67	1.67	48.89
	.	44.32	48.86	3.41	3.41	
	.	67.24	48.86	20.00	15.79	
WEST	4	19	45	12	16	92
	.	29.6	45.0	7.7	9.7	
	.	3.8	0.0	2.4	4.1	
	.	10.56	25.00	6.67	8.89	51 11
	.	20.65	48.91	13.04	17.39	
	.	32.76	51.14	80.00	84.21	
TOTAL	.	58	88	15	19	180
	.	32.22	48.89	8.33	10.56	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	21.158	DF= 3	PROB=0.0001
PHI	0.343		
CONTINGENCY COEFFICIENT	0.324		
CRAMER'S V	0.343		
LIKELIHOOD RATIO CHISQUARE	22.545	DF= 3	PROB=0.0001

applicable in the more forested eastern half of the state.

The greatest contribution to the chi-square value for item (k) overseeding legumes in tame pasture, comes from two response categories (Table XXIX). They are the "already using" and "does not apply" responses. More Group II east cooperators than expected are using the practice and less than expected indicated it did not apply. The relationship is reversed for the Group II west cooperators. This practice also appears to be more suited to the types of grazing operations found in the eastern half of the state.

Entire Population East vs. Entire Population West

Many of the east/west relationships from H_o^{6a} hold true for hypothesis H_o^{6c}. Differences appear to be based on ecological suitability and economic feasibility. In an item analysis for survey question 17 for H_o^{6c}, the entire population east compared to the entire population west, ten items exhibited significant chi-square values (Tables XXX through XXXIX). The "does not apply" response makes the greatest contribution to the chi-square value for items (a) (Table XXX) plant native grasses, (b) (Table XXXI) retain woodlots, (c) (Table XXXII) protect existing wetlands, (i) (Table XXXVI) fencing farm ponds, and (m) (Table XXXIX) managing brush for wildlife cover. In each case the portion of the population east of Interstate 35 responded less than

TABLE XXX

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--PLANT NATIVE GRASSES

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	0	1	0	0	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	.
	.	.	.	.	.	
	.	.	.	.	.	
EAST	7	53	90	25	25	193
	.	44.2	93.5	21.6	33.7	
	.	1.7	0.1	0.5	2.2	
	.	13.80	23.44	6.51	6.51	50.26
	.	27.46	46.63	12.95	12.95	
	.	60.23	48.39	58.14	37.31	
WEST	15	35	96	18	42	191
	.	43.8	92.5	21.4	33.3	
	.	1.8	0.1	0.5	2.3	
	.	9.11	25.00	4.69	10.94	49.74
	.	18.32	50.26	9.42	21.99	
	.	39.77	51.61	41.86	62.69	
TOTAL	.	88	186	43	67	384
	.	22.92	48.44	11.20	17.45	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	9.318	DF= 3	PROB=0.0253
PHI	0 156		
CONTINGENCY COEFFICIENT	0.154		
CRAMER'S V	0.156		
LIKELIHOOD RATIO CHISQUARE	9.397	DF= 3	PROB=0.0245

TABLE XXXI

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--RETAIN EXISTING WOODLOTS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	1	0	0	0	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	.
	.	.	.	.	.	
	.	.	.	.	.	
EAST	2	92	67	14	25	198
	.	80.2	61.2	11.0	45.6	
	.	1.7	0.6	0.8	9.3	
	.	23.29	16.96	3.54	6.33	50.13
	.	46.46	33.84	7.07	12.63	
	.	57.50	54.92	63.64	27.47	
WEST	9	68	55	8	66	197
	.	79.8	60.8	11.0	45.4	
	.	1.7	0.6	0.8	9.4	
	.	17.22	13.92	2.03	16.71	49.87
	.	34.52	27.92	4.06	33.50	
	.	42.50	45.08	36.36	72.53	
TOTAL	.	160	122	22	91	395
	.	40.51	30.89	5.57	23.04	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	24.887	DF=	3	PROB=0.0001
PHI	0.251			
CONTINGENCY COEFFICIENT	0.243			
CRAMER'S V	0.251			
LIKELIHOOD RATIO CHISQUARE	25.605	DF=	3	PROB=0.0001

TABLE XXXII

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--PROTECT EXISTING WETLANDS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	1	0	0	0	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	.
	.	.	.	.	.	
	.	.	.	.	.	
EAST	6	32	56	23	83	194
	.	27.9	45.3	19.9	101.0	
	.	0.6	2.5	0.5	3.2	
	.	8.21	14.36	5.90	21.28	49.74
	.	16.49	28.87	11.86	42.78	
	.	57.14	61.54	57.50	40.89	
WEST	10	24	35	17	120	196
	.	28.1	45.7	20.1	102.0	
	.	0.6	2.5	0.5	3.2	
	.	6.15	8.97	4.36	30.77	50.26
	.	12.24	17.86	8.67	61.22	
	.	42.86	38.46	42.50	59.11	
TOTAL	.	56	91	40	203	390
	.	14.36	23.33	10.26	52.05	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	13.623	DF= 3	PROB=0.0035
PHI	0.187		
CONTINGENCY COEFFICIENT	0.184		
CRAMER'S V	0.187		
LIKELIHOOD RATIO CHISQUARE	13.712	DF= 3	PROB=0.0033

TABLE XXXIII

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--LAND REVERT TO WILDLIFE HABITAT

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
	0	0	0	0	1	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
EAST	6	33	56	78	27	194
	.	33.8	65.2	65.2	29.8	
	.	0.0	1.3	2.5	0.3	
	.	8.46	14.36	20.00	6.92	49.74
	.	17.01	28.87	40.21	13.92	
	.	48.53	42.75	59.54	45.00	
WEST	10	35	75	53	33	196
	.	34.2	65.8	65.8	30.2	
	.	0.0	1.3	2.5	0.3	
	.	8.97	19.23	13.59	8.46	50.26
	.	17.86	38.27	27.04	16.84	
	.	51.47	57.25	40.46	55.00	
TOTAL	.	68	131	131	60	390
	.	17.44	33.59	33.59	15.38	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	8.175	DF= 3	PROB=0.0425
PHI	0.145		
CONTINGENCY COEFFICIENT	0.143		
CRAMER'S V	0.145		
LIKELIHOOD RATIO CHISQUARE	8.215	DF= 3	PROB=0.0418

TABLE XXXIV

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--LEAVE GRAIN FOR WINTER FOOD

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	0	0	0	1	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	.
	.	.	.	.	.	
	.	.	.	.	.	
EAST	5	7	59	51	78	195
	.	10.5	58.1	70.2	56.1	
	.	1.2	0.0	5.2	8.5	
	.	1.80	15.17	13.11	20 05	50.13
	.	3.59	30.26	26.15	40.00	
	.	33.33	50.86	36.43	69.64	
WEST	12	14	57	89	34	194
	.	10.5	57.9	69.8	55.9	
	.	1.2	0.0	5.3	8.6	
	.	3.60	14.65	22.88	8.74	49.87
	.	7.22	29.38	45.88	17.53	
	.	66.67	49.14	63.57	30.36	
TOTAL	.	21	116	140	112	389
	.	5.40	29.82	35.99	28.79	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	29.965	DF= 3	PROB=0.0001
PHI	0.278		
CONTINGENCY COEFFICIENT	0.267		
CRAMER'S V	0.278		
LIKELIHOOD RATIO CHISQUARE	30.616	DF= 3	PROB=0 0001

TABLE XXXV

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--RESTRICT GRAZING WOODED AREAS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	0	0	0	1	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	.
	.	.	.	.	.	
	.	.	.	.	.	
EAST	11	27	56	70	36	189
	.	25.1	58.6	57.1	48.2	
	.	0.1	0.1	2.9	3.1	
	.	7.03	14.58	18.23	9.38	49.22
	.	14.29	29.63	37.04	19.05	
	.	52.94	47.06	60.34	36.73	
WEST	11	24	63	46	62	195
	.	25.9	60.4	58.9	49.8	
	.	0.1	0.1	2.8	3.0	
	.	6.25	16.41	11.98	16.15	50.78
	.	12.31	32.31	23.59	31.79	
	.	47.06	52.94	39.66	63.27	
TOTAL	.	51	119	116	98	384
	.	13.28	30.99	30.21	25.52	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	12.361	DF=	3	PROB=0.0062
PHI	0.179			
CONTINGENCY COEFFICIENT	0.177			
CRAMER'S V	0.179			
LIKELIHOOD RATIO CHISQUARE	12.478	DF=	3	PROB=0.0059

TABLE XXXVI

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--FENCE FARM PONDS

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	0	0	0	1	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
EAST	9	19	74	80	18	191
	.	15.4	59.7	86.0	29.8	
	.	0.8	3.4	0.4	4.7	
	.	4.95	19.27	20.83	4.69	49.74
	.	9.95	38.74	41.88	9.42	
	.	61.29	61.67	46.24	30.00	
WEST	13	12	46	93	42	193
	.	15.6	60.3	87.0	30.2	
	.	0.8	3.4	0.4	4.7	
	.	3.13	11.98	24.22	10.94	50.26
	.	6.22	23.83	48.19	21.76	
	.	38.71	38.33	53.76	70.00	
TOTAL	.	31	120	173	60	384
	.	8.07	31.25	45.05	15.63	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	18.681	DF= 3	PROB=0.0003
PHI	0.221		
CONTINGENCY COEFFICIENT	0.215		
CRAMER'S V	0.221		
LIKELIHOOD RATIO CHISQUARE	19.030	DF= 3	PROB=0.0003

TABLE XXXVII

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--LEAVE 50% GROWTH ON PASTURE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	1	0	0	0	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	.
	.	.	.	.	.	
	.	.	.	.	.	
EAST	10	27	81	74	8	190
	.	37.7	78.8	59.3	14.2	
	.	3.0	0.1	3.7	2.7	
	.	6.96	20.88	19.07	2.06	48.97
	.	14.21	42.63	38.95	4.21	
	.	35.06	50.31	61.16	27.59	
WEST	8	50	80	47	21	198
	.	39.3	82.2	61.7	14.8	
	.	2.9	0.1	3.5	2.6	
	.	12 89	20.62	12.11	5.41	51.03
	.	25.25	40.40	23.74	10.61	
	.	64.94	49.69	38.84	72.41	
TOTAL	.	77	161	121	29	388
	.	19.85	41.49	31.19	7.47	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	18.572	DF= 3	PROB=0.0003
PHI	0.219		
CONTINGENCY COEFFICIENT	0 214		
CRAMER'S V	0.219		
LIKELIHOOD RATIO CHISQUARE	18.934	DF= 3	PROB=0.0003

TABLE XXXVIII

CONTINGENCY TABLE, ENTIRE POPULATION EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--OVERSEED LEGUMES IN PASTURE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
.	0	1	0	0	0	.
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	.
	.	.	.	.	.	
	.	.	.	.	.	
EAST	10	80	91	12	7	190
	.	53.7	93.0	21.7	21.7	
	.	12.9	0.0	4.3	9.9	
	.	20.73	23.58	3.11	1.81	49.22
	.	42.11	47.89	6.32	3.68	
	.	73.39	48.15	27.27	15.91	
WEST	10	29	98	32	37	196
	.	55.3	96.0	22.3	22.3	
	.	12.5	0.0	4.2	9.6	
	.	7.51	25.39	8.29	9.59	50.78
	.	14.80	50.00	16.33	18.88	
	.	26.61	51.85	72.73	84.09	
TOTAL	.	109	189	44	44	386
	.	28.24	48.96	11.40	11.40	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	53.587	DF= 3	PROB=0.0001
PHI	0.373		
CONTINGENCY COEFFICIENT	0.349		
CRAMER'S V	0.373		
LIKELIHOOD RATIO CHISQUARE	56.858	DF= 3	PROB=0.0001

TABLE XXXIX

CONTINGENCY TABLE, ENTIRE POPULATION, EAST VS WEST, COOPERATORS' WILLINGNESS TO USE SELECTED PRACTICES--MANAGE BRUSH TO LEAVE COVER

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		ALREADY USING	WILLING TO USE	UNWILLING TO USE	DOES NOT APPLY	TOTAL
	0	1	0	0	0	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
	.	.	.	.	.	
EAST	4	71	81	30	14	196
	.	57.6	82.9	28.3	27.3	
	.	3.1	0.0	0.1	6.5	
	.	17.97	20.51	7.59	3.54	49.62
	.	36.22	41.33	15.31	7.14	
	.	61.21	48.50	52.63	25.45	
WEST	7	45	86	27	41	199
	.	58.4	84.1	28.7	27.7	
	.	3.1	0.0	0.1	6.4	
	.	11.39	21.77	6.84	10.38	50.38
	.	22.61	43.22	13.57	20 60	
	.	38.79	51.50	47.37	74.55	
TOTAL	.	116	167	57	55	395
	.	29.37	42.28	14.43	13.92	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	19.368	DF= 3	PROB=0.0002
PHI	0.221		
CONTINGENCY COEFFICIENT	0.216		
CRAMER'S V	0.221		
LIKELIHOOD RATIO CHISQUARE	20.008	DF= 3	PROB=0.0002

expected in the "does not apply" category while western respondents indicated more frequently than expected the practices did not apply. These five practices are more applicable by respondents in the eastern group.

The greatest contribution to the chi-square value for item (d) allowing land to revert to wildlife habitat, comes from the "unwilling to use" category (Table XXXIII). More eastern cooperators than expected were unwilling to use the practice. Fewer western cooperators than expected were unwilling to use the practice.

The practice of leaving grain for winter food (f) appears to gain significance from two response categories, "unwilling to use" and "does not apply" (Table XXXIX). Fewer eastern cooperators than expected were unwilling to use the practice, yet more than expected indicated it did not apply. The reverse is true for the western cooperators. As previously discussed, western cooperators are unwilling to use the practice which has more application for them relative to eastern cooperators.

For item (g) restricted grazing on wooded areas, the "unwilling to use" and "does not apply" responses make the largest contribution to the chi-square value (Table XXXV). More eastern cooperators than expected were unwilling to use the practice and fewer than expected indicated it did not apply. Again this indicates that the eastern cooperators are more unwilling to use a practice which is more

applicable to them.

Three response categories make relatively large contributions to the chi-square value for item (j) leaving 50 percent annual growth on pasture and rangeland (Table XXXVII). More western cooperators than expected were already using the practice and fewer western cooperators than expected were unwilling to use the practice. More western cooperators than expected indicated the practice did not apply. This also indicates that leaving 50 percent of the annual growth on pasture and range is probably a more applicable practice in the east, yet fewer than expected are using the practice and more than expected are unwilling to use the practice.

For item (k) overseeding legumes on tame pasture, three response categories make relatively great contributions to the chi-square value (Table XXXVIII). More eastern cooperators than expected are using the practice, fewer eastern cooperators than expected are unwilling to use the practice and fewer eastern cooperators than expected indicated the practice did not apply. This practice is an example of a practice which is perceived by the cooperator as production oriented and is wildly accepted in the region where it is suited for use.

Demographic Characteristics of Cooperators

Research Objective 7 was to determine if differences

exist between Group I and Group II for selected demographic characteristics. Research Objective 7 was met through testing one null hypothesis. In addition, the demographic data gathered for the study population was compared to data gathered for Oklahoma in the 1978 census of agriculture (U.S. Department of Commerce, Bureau of the Census, 1981). The nonstatistical comparision revealed no major differences for the cooperators in the study and the general agriculture population. To test the hypothesis, responses to survey questions 23, 24, 25, 27, 29, 30, 32, 33, 37, 39, and 43 were analyzed using the chi-square statistic. Table XL displays the chi-square values for the selected demographic characteristics.

While the study population did not differ substantially from the general public, the analysis yielded several statistically significant differences within the study populations Group I and II. Questions 23, 24, 27, 29, 30, 33, and 39 exhibited significant chi-square values. The null hypotheses for Research Objective 7 was rejected: this indicates there are statistically significant differences for demographic variables between Group I and Group II (Tables XLI through XLVI). The largest contribution for the chi-square value for question 23, were you reared on a farm or ranch, comes from the "no" response. More Group I cooperators than expected were not raised on a farm or ranch (Table XLI). The response categories "29 - 39" years and

TABLE XL

SOCIOECONOMIC DEMOGRAPHIC VARIABLES
CHI SQUARE VALUES

Question	N	chi^2	df	p	signif.
23	403	6.604	1	.0102	yes
24	407	18.842	5	.0021	yes
25	405	2.581	6	.8593	no
27	406	39.056	5	0.0001	yes
29	391	30.540	5	0.0001	yes
30	395	38.898	5	0.0001	yes
32	396	0.300	1	.5836	no
33	397	22.840	3	0.0001	yes
37	398	2.084	1	.1488	no
39	400	19.05	5	.0019	yes
43	396	8.002	6	.2380	no

The data for the questions which exhibited significance is displayed in Tables XLI through XLVII.

TABLE XLI

CONTINGENCY TABLE, ENTIRE POPULATION, QUESTION 23:
WERE YOU REARED ON A FARM OR RANCH?

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	YES	NO	TOTAL
COOPERATORS	3	168	45	213
	.	177.6	35.4	
	.	0.5	2.6	
	.	41.69	11.17	52.85
	.	78.87	21.13	
	.	50.00	67.16	
DIRECTORS	1	168	22	190
	.	158.4	31.6	
	.	0.6	2.9	
	.	41.69	5.46	47.15
	.	88.42	11.58	
	.	50.00	32.84	
TOTAL	.	336	67	403
	.	83.37	16.63	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	6.604	DF= 1	PROB=0.0102
PHI	-0.128		
CONTINGENCY COEFFICIENT	0.127		
CRAMER'S V	0.128		
LIKELIHOOD RATIO CHISQUARE	6.745	DF= 1	PROB=0 0094
CONTINUITY ADJ. CHI-SQUARE	5.934	DF= 1	PROB=0.0149
FISHER'S EXACT TEST (1-TAIL)			PROB=0.0070
(2-TAIL)			PROB=0.0109

Key: Cooperators = Group I
Directors = Group II

TABLE XLII

CONTINGENCY TABLE, ENTIRE POPULATION, COOPERATOR AGE

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	18-28	29-39	40-50	51-61	62-72	73+	TOTAL
COOPERATORS	1	40	44	69	52	10	216
	1.1	29.2	43.0	66.9	56.8	19.1	
	0.0	4.0	0.0	0.1	0.4	4.3	
	0.25	9.83	10.81	16.95	12.78	2.46	53.07
	0.46	18.52	20.37	31.94	24.07	4.63	
	50.00	72.73	54.32	54.76	48.60	27.78	
DIRECTORS	1	15	37	57	55	26	191
	0.9	25.8	38.0	59.1	50.2	16.9	
	0.0	4.5	0.0	0.1	0.5	4.9	
	0.25	3.69	9.09	14.00	13.51	6.39	46.93
	0.52	7.85	19.37	29.84	28.80	13.61	
	50.00	27.27	45.68	45.24	51.40	72.22	
TOTAL	2	55	81	126	107	36	407
	0.49	13.51	19.90	30.96	26.29	8.85	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	18.842	DF= 5	PROB=0.0021
PHI	0.215		
CONTINGENCY COEFFICIENT	0.210		
CRAMER'S V	0.215		
LIKELIHOOD RATIO CHISQUARE	19.455	DF= 5	PROB=0.0016

Key: Cooperators = Group I
Directors = Group II

TABLE XLIII

CONTINGENCY TABLE, ENTIRE POPULATION, NUMBER OF YEARS RESPONDENT HAS BEEN FARMING OR RANCHING

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT		5 OR LESS	6-12	13-20	21-31	32-42	43+	TOTAL
COOPERATORS	1	20	41	25	47	44	38	215
	.	11.7	28.6	25.4	42.4	51.9	55.1	
	.	6.0	5.4	0.0	0.5	1.2	5.3	
	.	4.93	10.10	6.16	11.58	10.84	9.36	52.96
	.	9.30	19.07	11.63	21.86	20.47	17.67	
	.	90.91	75.93	52.08	58.75	44.90	36.54	
DIRECTORS	0	2	13	23	33	54	66	191
	.	10.3	25.4	22.6	37.6	46.1	48.9	
	.	6.7	6.1	0.0	0.6	1.4	6.0	
	.	0.49	3.20	5.67	8.13	13.30	16.26	47.04
	.	1.05	6.81	12.04	17.28	28.27	34.55	
	.	9.09	24.07	47.92	41.25	55.10	63.46	
TOTAL	.	22	54	48	80	98	104	406
	.	5.42	13.30	11.82	19.70	24.14	25.62	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	39.056	DF= 5	PROB=0.0001
PHI	0.310		
CONTINGENCY COEFFICIENT	0.296		
CRAMER'S V	0.310		
LIKELIHOOD RATIO CHISQUARE	42.127	DF= 5	PROB=0.0001

Key: Cooperator = Group I
Director = Group II

TABLE XLIV

CONTINGENCY TABLE, ENTIRE POPULATION, NUMBER OF YEARS RESPONDENT HAS BEEN A CONSERVATION DISTRICT COOPERATOR

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	5 OR LESS	6-12	13-20	21-31	32-42	43+	TOTAL
COOPERATORS	9	51	43	30	38	29	16	207
	.	34.9	35.5	36.5	43.9	40.8	15.4	
	.	7.4	1.6	1.2	0.8	3.4	0.0	
	.	13.04	11.00	7.67	9.72	7.42	4.09	52.94
	.	24.64	20.77	14.49	18.36	14.01	7.73	
	.	77.27	64.18	43.48	45.78	37.66	55.17	
DIRECTORS	7	15	24	39	45	48	13	184
	.	31.1	31.5	32.5	39.1	36.2	13.6	
	.	8.3	1.8	1.3	0.9	3.8	0.0	
	.	3.84	6.14	9.97	11.51	12.28	3.32	47.06
	.	8.15	13.04	21.20	24.46	26.09	7.07	
	.	22.73	35.82	56.52	54.22	62.34	44.83	
TOTAL	.	66	67	69	83	77	29	391
	.	16.88	17.14	17.65	21.23	19.69	7.42	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	30.540	DF= 5	PROB=0.0001
PHI	0.279		
CONTINGENCY COEFFICIENT	0.269		
CRAMER'S V	0.279		
LIKELIHOOD RATIO CHISQUARE	31.674	DF= 5	PROB=0.0001

Key: Cooperators = Group I
Directors = Group II

TABLE XLV

CONTINGENCY TABLE, ENTIRE POPULATION, NUMBER OF YEARS OPERATING CURRENT LAND

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	5 OR LESS	6-12	13-20	21-31	32-42	43+	TOTAL
COOPERATORS	3	25	35	23	33	28	69	213
	.	14.0	24.8	19.4	38.8	37.7	78.2	
	.	8.6	4.2	0.7	0.9	2.5	1.1	
	.	6.33	8.86	5.82	8.35	7.09	17.47	53.92
	.	11.74	16.43	10.80	15.49	13.15	32.39	
	.	96.15	76.09	63.89	45.83	40.00	47.59	
DIRECTORS	9	1	11	13	39	42	76	182
	.	12.0	21.2	16.6	33.2	32.3	66.8	
	.	10.1	4.9	0.8	1.0	2.9	1.3	
	.	0.25	2.78	3.29	9.87	10.63	19.24	46.08
	.	0.55	6.04	7.14	21.43	23.08	41.76	
	.	3.85	23.91	36.11	54.17	60.00	52.41	
TOTAL	.	26	46	36	72	70	145	395
	.	6.58	11.65	9.11	18.23	17.72	36.71	100 00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	38.898	DF=	5	PROB=0.0001
PHI	0.314			
CONTINGENCY COEFFICIENT	0.299			
CRAMER'S V	0.314			
LIKELIHOOD RATIO CHISQUARE	44.766	DF=	5	PROB=0.0001

Key: Cooperators = Group I
Directors = Group II

TABLE XLVI

CONTINGENCY TABLE, ENTIRE POPULATION, PERCENT OF FAMILY INCOME DERIVED FROM FARMING

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	1-25%	26-50%	51-75%	76-100%	TOTAL
COOPERATORS	4	91	30	45	46	212
	.	72.1	33.6	42.2	64.1	
	.	5.0	0.4	0.2	5.1	
	.	22.92	7.56	11.34	11.59	53.40
	.	42.92	14.15	21.23	21.70	
	.	67.41	47.62	56.96	38.33	
DIRECTORS	6	44	33	34	74	185
	.	62.9	29.4	36.8	55 9	
	.	5.7	0.5	0.2	5.8	
	.	11.08	8.31	8.56	18 64	46.60
	.	23.78	17.84	18.38	40.00	
	.	32.59	52.38	43.04	61.67	
TOTAL	.	135	63	79	120	397
	.	34.01	15.87	19.90	30.23	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	22.840	DF= 3	PROB=0.0001
PHI	0.240		
CONTINGENCY COEFFICIENT	0.233		
CRAMER'S V	0.240		
LIKELIHOOD RATIO CHISQUARE	23.146	DF= 3	PROB=0.0001

Key: Cooperators = Group I
Directors = Group II

"73+" years make the greatest contribution to the chi square value for the responses on question 24, age. More Group I cooperators than expected were in the "29 - 39" category while more Group II cooperators than expected were in the "73+" category (Table XLII).

Questions 27, 29, and 30 each deal with the number of years a cooperator has been associated with one of the demographic variables. Three response categories, "5 or less" years, "6 - 12" years, and "43+" years make relatively large contributions to the significant chi-square value for the responses on question 27 (Table XLIII), the number of years farming and ranching. More Group I cooperators than expected show up in the "5 or less" and "6 - 12" categories. More Group II cooperators than expected show up in the "43+" category. For question 29 (Table XLIV) the number of years a respondent has been a conservation district cooperator, two categories make relatively large contributions to the chi-square value for the responses. More Group I cooperators than expected are in the "5 or less" years category and more Group II cooperators than expected are found in the "32 - 42" years response category. For the number of years a cooperator or his family have operated the current land they farm or ranch, question 30 (Table XLV), two response categories make relatively large contributions to the chi-square value. More Group I cooperators than expected are found in the "5 or less" and "6 - 12" years response categories.

Survey question 33 (Table XLVI), which indicates the percent of family income received from farming, has two response categories which make relatively large contributions to the chi-square value. Fewer Group II cooperators responses than expected were in the "1 - 25 percent" response category and more Group II cooperators responses than expected were found in the "76 - 100 percent" response category.

For acres operated, question 39 (Table XLVII), more cooperators from Group I than expected are found in the response categories for " 80 acres", "81 - 160 acres" and "161 - 320 acres". More Group II cooperators responses than expected were found in the " 800 acres" response category.

Summary

In summary, findings indicate that the cooperators in the study have positive attitudes and their property holdings have potential for wildlife. The most preferred program characteristic was control of soil erosion and better trespass laws was the most preferred type of assistance. There was significant variation in the willingness to use selected soil and wildlife conservation practices. Much of that variation is based along the lines of significant differences in groups divided on the basis of direction of the location of holdings from Interstate 35.

Three interrelated elements seem to influence the

TABLE XLVII

CONTINGENCY TABLE, ENTIRE POPULATION, NUMBER OF ACRES OPERATED

FREQUENCY EXPECTED CELL CHI2 PERCENT ROW PCT COL PCT	.	<80 ACRES	81-160 ACRES	161-320 ACRES	321-640 ACRES	641-800 ACRES	> 800 ACRES	TOTAL
COOPERATORS	2	20	29	33	35	19	78	214
	.	15.0	22.5	25.1	39.6	19.3	92.6	
	.	1.7	1.9	2.5	0.5	0.0	2.3	
	.	5.00	7.25	8.25	8.75	4.75	19.50	53.50
	.	9.35	13.55	15.42	16.36	8.88	36.45	
	.	71.43	69.05	70.21	47.30	52.78	45.09	
DIRECTORS	5	8	13	14	39	17	95	186
	.	13.0	19.5	21.9	34.4	16.7	80.4	
	.	1.9	2.2	2.8	0.6	0.0	2.6	
	.	2.00	3.25	3.50	9.75	4.25	23.75	46.50
	.	4.30	6.99	7.53	20.97	9.14	51.08	
	.	28.57	30.95	29.79	52.70	47.22	54.91	
TOTAL	.	28	42	47	74	36	173	400
	.	7.00	10.50	11.75	18.50	9.00	43.25	100.00

STATISTICS FOR 2-WAY TABLES

CHI-SQUARE	19.050	DF= 5	PROB=0.0019
PHI	0.218		
CONTINGENCY COEFFICIENT	0.213		
CRAMER'S V	0.218		
LIKELIHOOD RATIO CHISQUARE	19.509	DF= 5	PROB=0.0015

Key: Cooperators = Group I
Directors = Group II

east/west relationships found in the analysis for research objective 6:

1. The cooperators perception of the practice as it related to his production needs;

2. The ecological suitability of the practice for eastern and western regions; and

3. The economic feasibility of the practice for the cooperators operation.

These three elements appear to be operating together in determining the willingness of cooperators to use the 13 selected practices.

The ecological suitability of a practice is determined by differences in soil type, annual rainfall amounts, and other environmental factors. The factors dictate the type of agricultural operations found in an area. In turn this makes certain practices more suitable for use in a particular region. An example would be the east/west response for item (g) restricting grazing on woodlots.

Economic forces appear to have entered the cooperators' decision making process when the data indicate a practice which is more applicable to a specific region is less well received in that region. Item (f) leaving strips of grain for wildlife is probably an example of the influence of economics on the east/west relationships. The percentages displayed in Table VI probably represent the impact of the cooperators perception of a practice relative to

agricultural production. The higher percentage of current use appears to indicate that the more readily apparent the production benefits of a practice, the more likely it will be used.

Demographic characteristics for background, age, number of years farming or ranching, number of years a district cooperator, farm tenure, and percent of income from farming exhibited statistically significant differences. The data for the study population does not differ radically from the demographic data from Oklahoma farmers fround in the 1978 census of agriculture (U.S. Dept. of Commerce, Bureau of the Census, 1981).

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Problem

Trends indicate that wildlife habitat on private lands is disappearing or deteriorating in quality. Wildlife as an unpriced byproduct of agriculture and a common property resource cannot compete with cash crops unless conscious effort is given to habitat maintenance. Private landowners hold the key to maintaining habitat on private land. Programs to insure the future of wildlife habitat are needed. These programs need to be compatible with agricultural production, cost effective, flexible, and targeted to specific regions.

Central to developing a successful habitat program on agricultural lands is an understanding of the attitudes and preferences of the private agricultural landowner. The viewpoints of landowners are critical and they must be full participants in developing constructive change (Unger, 1977). The purpose of this research was to establish baseline data for more effective conservation planning and implementation of more compatible agricultural land/wildlife

habitat management strategies based on landowner preferences.

Procedure

The research problem was approached through the development of a questionnaire designed to solicit attitudinal and preferential responses and to collect data on current land use practices as well as socioeconomic/demographic data. The questionnaire was disseminated through one mailing to randomly selected conservation district cooperators. One follow-up thank you/reminder mailing was made. All questionnaires were coded and entered into the Oklahoma State University computer system. The SAS analysis package was used to analyze the data.

Findings

Research Objective 1

Conservation district cooperators do exhibit a positive attitude toward wildlife and habitat based on scores from survey question 20.

Hypotheses H_o^{1}, H_o^{1a}, and H_o^{1b} were rejected.

Hypotheses H_o^{1c} and H_o^{1d} were not rejected.

Research Objective 2

The agricultural properties in the study do show positive potential for wildlife habitat based on the diversity rating used in the study.

Hypotheses H_o^2, H_o^{2a}, and H_o^{2b} were rejected.

Hypotheses H_o^{2c} and H_o^{2d} were not rejected.

Research Objective 3

The expressed attitudes of the district cooperators did exhibit a positive correlation with the potential condition of their holdings relative to wildlife habitat.

Hypotheses H_o^3, H_o^{3a}, and H_o^{3b} were rejected.

Research Objective 4

Characteristics of a conservation agency assistance program that are more preferred were identified for the entire population, Group I and Group II.

Research Objective 5

Preferred types of assistance for a habitat assistance program were identified for the entire population, Group I and Group II.

Research Objective 6

Differences exist in the willingness to use each of 13 soil and wildlife conservation practices in each group considered. Distinctive differences exist between groups east and west of Interstate 35.

Hypotheses H_o^6, H_o^{6a}, H_o^{6b}, and H_o^{6c} were rejected.

Research Objective 7

Ten socioeconomic/demographic variables were considered and seven exhibited statistically significant differences.

Hypothesis H_o^7 was rejected.

Conclusions

Conservation district directors (Group II) do not differ a great deal from the cooperators (Group I) they represent. Statistically significant demographic findings describe them as older, more economically dependent on their land, owners of larger holdings, more often raised on a farm or ranch, and having been a conservation district cooperator a longer length of time. Directors are generally less willing to accept free materials or cash payments. Directors also tend to value technical assistance more than the cooperators (Group I) value them. In spite of those differences, directors and cooperators tend to express similar attitudes and preferences. The holdings of the district directors exhibit only a slightly higher mean score for the diversity rating for potential relative to wildlife habitat.

The resource planner working with district cooperator must temper his enthusiasm over their positive attitude with the information that over 70 percent of them indicated that farmers who enjoy wildlife sometimes forego wildlife habitat for economic gain. The unwillingness of cooperators to use less production oriented soil and wildlife conservation practices bears out this point further. The power of the marketplace is felt. The positive reaction to the idea of habitat improvement must be tempered by the framework of the current farm economy as Bishop (1981) warned. The positive nature of the attitudes expressed by cooperators in this

study also presents a clear message to agriculture oriented conservation agencies. Wildlife is important to landowners. They do tend to consider wildlife when making land use decisions and agency personnel who offer planning assistance should try to accommodate the landowners' interest in wildlife.

The potential of integrated land management for wildlife is very positive. In order to bring that potential to reality, habitat planning and assistance is needed. The need for species specific research and practice specific research must be met if the potential is to be reached. It is encouraging that minimum tillage was used by almost 20 percent of the respondents compared to only one fourth who still use the moldboard plow as their primary method of tillage. Given the positive attitude and the potential of the land holdings, progress could be made if a program could be designed to meet landowner preferences.

The findings relative to programs are consistent with similar findings in related studies. The most important characteristic of an assistance program to cooperators is that it control soil erosion. Habitat programs which carry multiple benefits such as controlling erosion should be easily marketable. This "back door" approach has to be a conscious one or the wildlife benefits could be lost. The manner in which a habitat program or practice is packaged for promotion with landowners is critical. The landowners

perception of compatibility to agricultural production is extremely important.

Wildlife as a secondary land use on all classes of land should be promoted. Farming lands which do not fall into the prime farm land category create conservation problems. The solutions to these problems, the application of conservation measures, gives these lands a greater potential for wildlife benefits.

Practices that benefit wildlife on agricultural lands must fit into a program which is compatible with the production of other products of the land. The feature which has the potential for motivation conservation district cooperators to participate in a habitat program is controlling soil erosion. Because of the variety of situations found on the land from east to west it is difficult to make sweeping generalizations about specific practices offered. One thing is clear, however: landowners are interested in wildlife and soil conservation. Research on the impacts of specific wildlife/soil conservation practices could reveal the potential for increased benefits to local wildlife populations through minor modifications in farming techniques.

The types of assistance cooperators indicate they would be very likely to use make two major points. Abuse of private property rights by the public and trespass are major disincentives for maintaining wildlife habitat. Better trespass laws and increased enforcement were the two types

of assistance cooperators were most likely to choose. Following these were items which are similar to the Missouri (1981) and Oklahoma Department of Wildlife Conservation (1984) studies. Free/low cost plant materials, technical assistance, and tax breaks all ranked ahead of direct cash payments. Those who abuse private property rights of landowners are at least partially responsible for the declining habitat on private lands. These findings should send a clear message to consumptive and nonconsumptive users who pursue wildlife related recreation on private lands.

The statistically significant differences in the willingness to use soil and wildlife conservation practices in the eastern and western halves of the state have two major implications. In addition to the preferred characteristics of an assistance program, habitat programs must be compatible with ecological conditions and the type of agricultural operations found in a particular area. Programs should be targeted to specific geographic or land use areas.

A system is in place that could curb the decline in habitat quality on private lands. Why hasn't the system worked? The writer believes that there are at least four causes of the problem.

First, the perspectives of the wildlife planner and the agricultural planner do not always encourage communication. Each must realize the framework in which the other must

work. Soil/wildlife conservation measures offer common ground to both. These practices are an excellent starting point for a cooperative effort.

The second area which contributes to the problem is the lack of research on the impacts and benefits of specific practices. Based on such research, realistic habitat evaluation procedures for agricultural production units could be developed. This would provide both wildlife and agricultural planners a valuable tool for working with landowners. Perhaps regional species specific research relative to agricultural production would contribute to the need for targeting of programs and practices to specific geographic areas.

The third element which should be of concern it the packaging of a habitat improvement program. If must be multiple benefit and the landowner must perceive it as such. The program must capitalize on the benefits, be they agricultural production or wildlife that appeal to the cooperator. The selling of the program is in the hands of the agricultural technician. The technician must be sold first. Improved communication and a research base can aid in the education of the agriculturally oriented technician. The fourth part of the problem is the reoccurring instability of the farm economy. The relatively short term nature of the agricultural landowner's planning horizon should be a prime motivation for increased research and development of

soil/wildlife farming and ranching techniques. The writer believes it is unrealistic to think a stable farm economy is just around the corner. Methods to stop the decline of habitat quality in the current framework of the national farm economy are needed now. Sound conservation plans and the subsequent application of soil/wildlife conservation practices and the conservation plan offer the best opportunity.

The problems of maintaining wildlife habitat on agricultural lands are well documented. The analysis of the data and its interpretation lead to conclusions concerning why the problems exist. Economic and ecological conditions are readily identifiable. Other factors are not so readily apparent. The attitudes and agricultural operations of the cooperators have been shaped by national agricultural policies. These policies have traditionally been price and production oriented. Economic changes through time have prevented national agriculture policy from being based on soil, water and wildlife conservation. Program changes are needed which would reduce soil erosion and benefit wildlife resources. Restructuring of cost share programs has been suggested as a step in the right direction (Farris and Cole, 1981). Additional strategies are needed. The recommendations which follow could serve as a starting point for an increasing effort to improve the quality of wildlife habitat on Oklahoma's agricultural lands.

Recommendations

The following recommendations are based on the data from the study, its analysis, and interpretations and conclusions drawn from that analysis.

1. A series of wildlife habitat planning workshops should be held with Oklahoma conservation district and Soil Conservation Service personnel. These workshops should emphasize recognizing opportunities for wildlife habitat planning with landowners. They should also provide personnel with some overview of wildlife concepts and their relation to agricultural planning and should serve to introduce conservation district employees to wildlife department resource personnel.

2. Species specific habitat evaluation procedures should be developed for Oklahoma agricultural lands.

3. A habitat assistance program is needed in Oklahoma to maximize the potential of private agricultural lands for wildlife habitat. This program should be a cooperative effort between the wildlife department and conservation districts. It should not carry an access price tag but should contain program components to assist landowners in dealing with access related problems. The design of the program should take into account the landowners perception of the production "cost: of practices, the regional ecological suitability of the practices and program, offerings, and the economic feasibility of the practices and program relative to the changing agricultural economy.

4. Wildlife agencies should make an effort to work with and through conservation districts as to bring wildlife values to the attention of farm planners and access private landowners. The impact of such an effort can be imagined when one considers that the 407 individuals who responded to the questionnaire control 463,786 acres, or 1.13 percent of Oklahoma's agricultural lands.

5. A major education effort on landowner/private property rights and outdoor ethics should be undertaken. Wildlife "users" need to be made aware of their responsibility for the disappearance and declining quality of habitat on private lands.

6. Species specific research on the impacts of agricultural practices on wildlife populations should be continued.

7. The wildlife and agriculture communities must recognize the constraints each face and further communication and research in the areas where they share common ground.

8. Conservation districts and the Soil Conservation Service should target additional conservation practices and techniques such as minimum tillage which are beneficial to wildlife for promotion campaigns in Oklahoma.

9. Additional analysis of the data gathered in the study by dimensions other than cooperators and directors east and west groupings should be undertaken.

It is the researcher's hope that the information gathered in this study will make a positive contribution to the future of wildlife habitat on private agricultural lands in the state of Oklahoma.

BIBLIOGRAPHY

Applegate, J.E. 1981. Landowner's behavior in dealing with wildlife values. Pages 64-72 in Proceedings of Symposium: Wildlife Management on Private Lands in Milwaukee, Wisconsin, La Crosse Printing Co., Inc. La Crosse, Wisconsin.

Basore, N. and L. B. Best. 1982. No till effects on wildlife. Page 20 in Proceedings of the Midwest Agricultural Interfaces with Fish and Wildlife Resources Workshop, Iowa State University.

Basu, A.C., 1983. Director, Social Services Technology Development and Application, Soil Conservation Service. Remarks on adoption of soil conservation practices. National Information Coference, Soil Conservation Service, April 1983. Fort Worth, Texas.

Basu, A., B. T. Osgood and J. D. Diggs. 1982. Background paper on adoption and diffusion of soil and water conservation practices for the 1985 RCA process. In house document, Soil Conservation Service. 40pp.

Berryman, J.H. 1957. Our growing need: a place to produce and harvest wildlife. J. Wildl. Manage. 21:319-323.

Berryman, J. H. 1958. Maintaining fishing and hunting opportunities - a constructive approach. Pages 66-76 in Proceedings of the forty-eighth convention of the International Association of Game, Fish, and Conservation Commissioners. Hopkins, Minn.

Berryman, J. H. 1981. Needed now: an action program to maintain and manage wildlife habitat on private lands. Pages 5-10 in Proceedings of Symposium: Wildlife Management on Private Lands. Milwaulkee, Wisconsin, La Crosse Printing Co., Inc., La Cross, Wisconsin.

Bishop, R. C. 1981. Economic considerations affecting landowner behavior. Pages 73-87 in Proceedings of Symposium: Wildlife Management on Private Lands. Milwaulkee, Wisconsin, La Crosse Printing Co., Inc., La Crosse, Wisconsin.

Bishop, R. C. and T. A. Heberlein. 1979. Measuring values of extramarket goods: are indirect measures biased? Am. Agri. Econ. 61:926-930.

Birdwell, B. T. 1982. The relationship between farmers' soil conservation ethics and soil erosion. PhD. Dissertation. Oklahoma State University. 102 pp.

Bolle, A. W. and R. D. Taber. 1962. Economic aspects of wildlife abundance on farmland. J. Soil and Water Conservation. 23:1.

Carlson, J. E., D. A. Dillman, W. R. Lassey. 1981. "The Farmer and Erosion: Factors Influencing the Use of Control Practices". Bulletin No. 601, Agriculture Experiment Station, College of Agriculture, University of Idaho, Moscow, Idaho 83843. (April 1981).

Clearfield, F. 1984. USDA-SCS Social Scientist. National Technical Center, Fort Worth, Texas, Personal Communication.

Dahlgren, R. B. 1982. Crop production practices and wildlife section and soil conservation practices and wildlife section in Workshop Proceedings: Midwest Agricultural Interfaces with Fish and Wildlife Resources. Iowa State University. 54 pp.

Deknatel, C. 1979. Wildlife habitat on private lands: a planning approach to rural land use. J. Soil and Water Conservation. 34:260-263.

Dillman, D. A. 1978. Mail and telephone surveys: the total design method. John WIley and Sons, New York, New York. 325 pp.

Edwards, A. L. 1957. Techniques of Attitude Scale Construction. New York Appleton-Centry-Crofts, Inc.

Evans, W. 1981. Impacts of grazing intensity and specialized frazing systems on faunal compostition and productivity. Draft Report, Committee on Developing Strategies for Rangelands Management, National Research Council. National Academy of Sciences, Washington, D.C.

Farris, A. L. and S. H. Cole. 1981. Strategies and goals for wildlife habitat restoration on agricultural lands. In Transactions, 46th North American Wildlife and Natural Resources Conference. pp. 130-136.

Fisher, R. A. 1950. Statistical Methods for Research Workers. New York: Hafner Publishing Company.

Gottschalk, J. S. 1977. Wildlife habitat - the "price-less" resource base. Trans. North Am. Wildl. Nat. Res. Conf. 42:237-245.

Harmon, K. W. 1981. Future actions for management of private land wildlife. Pages 374-382 in Proceedings of Symposium: Wildlife Management on Private Lands, Milwaulkee, Wisconsin, La Crosse, Wisconsin.

Harmon, K. W. and M. N. Nelson. 1973. Wildlife and soil considerations in land retirement programs. Wildl. Soc. Bull. 1:28-38.

Henderson, F. R., ed. 1984. Guidelines for Increasing Wildlife on Farms and Ranches. Great Plains Agricultural Council Wildlife Resources Committee and Cooperative Extension Service, Kansas State University, Manhattan, Kansas.

Hoover, R. L. 1976. Incorporating fish and wildlife values in land use planning. Trans. North Am. Wildlife and Nat. Res. Conf. 41:279-289.

Horvath, W. J. 1976. Habitat programs and recreation opportunities on private agricultural land: opportunities and constraints. Trans. North Am. Wildl. and Nat. Resour. Conf. 41:504-517.

Kerlinger, F. N. 1973. Foundations of behavioral Research. 2nd ed. New York: Holt Rinehart and Winston, Inc.

Klimstra, W. D. 1982. Bobwhite Quail and Changing Land Use. In Proceedings, Second National Bobwhite Quail Sypmosium. Schitoskey, F., E. C. Schitoskey, and L. G. Talent, eds. Oklahoma State University, Stillwater, Oklahoma.

Leopold, A. 1947. The ecological conscience. Bull. Garden Club Am. 12:46-53.

Lovejoy, S. B. and F. D. Parent. 1981. "Social Aspects of a Nonpoint Source Water Pollution Abatement Program: A Panel Study of the Black Creek Project." Station Bulletin No. 350. Department of Agricultural Economics, Agricultural Experiment Station, Purdue University, West Layfeyette, Indiana. October, 1981. 31 p.

McConnell. C. A. 1981. Common threads in successful programs benefiting wildlife on private lands. Pages 279-288 in Proc. of Symposium: Wildlife Management on Private Lands, Milwaulkee, Wisconsin. La Crosse Printing Co., Inc., La Crosse, Wisconsin.

McConnell, C. A. and K. W. Harmon. 1976. Agricultural effects on wildlife in America: a brief history. Pages 35-44 in Proc. 31st Soil Conserv. Soc. Amer.

McCorkle, C. O. and J. E. Halver (ed.) 1982. Impacts of emerging agricultural trends on fish and wildlife habitat. National Academy Press, Washington, D.C. 303 pp.

Miranowski, J. A. and Bender, R. L. 1982. The effects of soil erosion control policies on wildlife habitat. Pages 21-22 in Proc. of the Midwest Agricultural Interfaces with Fish and Wildlife Resources Workshop, Iowa State University.

National Association of Conservation Districts. 1979. Pasture and range improvement report. National Association of Soil and Water Conservation Districts. Ankeney, Iowa. 38 pp.

Nowak, P. J. 1982. "Social Dimensions in the Adoption of Soil and Water Conservation Practices." Position paper prepared for the Soil Conservation Service. (April 30, 1982).

Oklahoma Conservation Commission. 1982. A Multi-Year Plan for Oklahoma's Natural Resources. 34 pp.

Oklahoma Department of Wildlife Conservation. 1984. Preliminary unpublished survey results. In house document. 7 pp.

Oppenheim, A. N. 1966. Questionnaire Design and Attitude Measurement. New York: Basic Books, Inc.

Phillips, F. D. 1983. Personal communication.

Pollard, L. 1981. Information and Education Division, Oklahoma Department of Wildlife Conservation. Personal communication.

Porter, M. D. 1984. Remarks at Noble Foundation wildlife field day. Allen, Oklahoma. Sept. 1984.

Randall, A. 1981. Resource Economics: An Approach to Natural Resources and Environmental Policy. (Chapter 8). Grid Publishing Incorporated, Columbus, Ohio. pp. 186-191.

Sebert, D. A. 1982. Market failure and wildlife habitat: problems and perceptions. Unpublished paper. 21 pp.

Shaw, C. P. and D. A. Gasner. 1975. Incentives to enhance timber and wildlife management on private lands. Trans. North Am. Wildl. Nat. Resour. Conf. 40:177-185.

Shaw. M. E. and J. M. Wright. 1967. Scales for the Measurement of Attitude. New York: McGraw-Hill Book Company.

Sheriff, S. L., D. J. Witter, S. B. Kirby, and K. M. Babcock. 1981. Missouri's landowners: how they perceive the importance of wildlife. Trans. North Am. Wildl. and Nat. Res. Conf. 46:118-124.

Skipper, J. K., A. I. Guenther, and G. Nass. 1967. "The Sacredness of .05: A Note Concerning the Uses of Statistical Levels of Significance in Social Science", The American Sociologist 2:16-18. February 1967.

SAS Institute. 1984. Changes and Entrancements in the Base SAS and SAS/GRAPH products under VMS, Version 4. SAS Institute Inc., SAS. Technical Report P-128. SAS Institute Inc., Cary, N.C.

Sudman, S. and N. M. Bradburn. 1982. Asking Questions: A practical guide to questionnaire design. Jossey-Bass Publishers. San Francisco, CA.

Soil Conservation Service. 1984. Fish and Wildlife Accomplishments in Oklahoma. In house document. January, 1984. 13 pp.

Soil Conservation Society of America. 1982. Resource Conservation Glossary. Ankeny, Iowa. 193 pp.

Teels, B. M. 1983. Wildlife as a secondary use to grazing. Kansas-Oklahoma Soc. for Range Manage., Stillwater, OK 7 pp.

Teels, B.M. 1985. USDA-SCS State Wildlife Biologist. Oklahoma State Office, Stillwater, OK. Personal Communication.

Warner, R. E. 1981. Factors affecting teh adotption of wildlife conservation practices by east-central Illinois farmers and their educational implications. Ph.D. Thesis, University of Illinois, Champaign-Urbana. 167 pp.

Unger, D. G. 1977. Needs for Conservation Practices. Trans. North Am. Wildl. Nat. Resour. Conf. 42:9-13.

U.S. Department of Agriculture, Soil Conservation Service. 1982. Oklahoma Resources Inventory, Statistical Data Tables. United States Department of Agriculture - Soil Conservation Service. Stillwater, Oklahoma. 84 pp.

U.S. Department of Agriculture - Soil Conservation Service. 1982. Personal correspondence with F. D. Phillips, Information Officer.

U.S. Department of Commerce, Bureau of the Census. 1978. 1978 Census of Agriculture. Vol. 1, Part 36, Oklahoma. AC 78-A-36. May 1981.

APPENDIX A

CONSERVATION AGRICULTURE AND WILDLIFE SURVEY

CONSERVATION AGRICULTURE AND WILDLIFE SURVEY

Following is a series of questions and statements concerning conservation programs, wildlife resources, and conservation practices. Please circle the response that best fits your feeling about each item. An example has been provided for your help.

SAMPLE STATEMENT	Strongly agree	Agree	Disagree	Strongly disagree	Undecided	
a. Oklahoma is a great state.	(1)	2	3	4	5	(a

The person who answered this statement strongly agreed with the statement.

PRACTICES

The following questions deal with farm and ranch practices you are using on your land. Please circle the most appropriate response following each question.

1. In the last 10 years, have you:	All	Most	Some	None	Does not apply	
a. increased the size of your individual fields?	1	2	3	4	5	(a
b. controlled any brush on your land?	1	2	3	4	5	(b
c. removed any windbreaks on your land?	1	2	3	4	5	(c
d. planted any windbreaks on your land?	1	2	3	4	5	(d
e. fenced any of your farm ponds?	1	2	3	4	5	(e
f. regularly mowed any of your roadsides?	1	2	3	4	5	(f
g. regularly left any odd areas in natural vegetation?	1	2	3	4	5	(g
h. removed any vegetation and trees along creek banks?	1	2	3	4	5	(h
i. established legumes in your pasture?	1	2	3	4	5	(i
j. converted woodland to pasture?	1	2	3	4	5	(j
k. converted woodland to cropland?	1	2	3	4	5	(k
l. converted rangeland to pasture?	1	2	3	4	5	(l
m. converted rangeland to cropland?	1	2	3	4	5	(m
n. converted cropland to pasture?	1	2	3	4	5	(n

2. Circle the number which corresponds to your primary method of tillage.

1. moldboard plow
2. stubble mulching
3. "no-till"/minimum tillage
4. other (specify)_____

	Always	Most of the time	Seldom	Never	Does not apply
3. If you have rangeland, do you generally remove more than 50% of the annual growth?	1	2	3	4	5
4. If you have pastureland, do you generally remove more than 50% of the annual growth?	1	2	3	4	5
5. If you have woodland, do you generally allow livestock to graze your woodland?	1	2	3	4	5

	Yes	No
6. Is improving or maintaining wildlife habitat a part of your district/SCS conservation plan?	1	2
7. Is any of your land posted?	1	2

8. To what extent has maintaining wildlife habitat on your land limited your farming or ranching operation? (circle the number)

1. severe limitations
2. moderate limitations
3. few limitations
4. no limitations

PROGRAMS

9. Below are some factors which farmers and ranchers have said affect their farm and ranch planning. Please indicate by circling the appropriate number the importance of each to your 3 to 5 year farm or ranch plan.

	Very important	Important	Less important	Not important	Does not apply	
a. Commodity markets (futures)	1	2	3	4	5	(a
b. USDA policy	1	2	3	4	5	(b
c. Your debt load	1	2	3	4	5	(c
d. ASCS assistance programs	1	2	3	4	5	(d
e. Livestock markets	1	2	3	4	5	(e
f. Interest rates	1	2	3	4	5	(f
g. Weather	1	2	3	4	5	(g
h. Availability of machinery/equipment	1	2	3	4	5	(h
i. Risk	1	2	3	4	5	(i
j. Local markets	1	2	3	4	5	(j
k. International markets	1	2	3	4	5	(k

10. Which of the above factors (letters a through k) are the most important to you? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____
Third choice_____

11. Following are some general characteristics of assistance programs offered by conservation agencies. How important do you consider each one to be when you are deciding whether or not to participate in a conservation program? Please circle the most appropriate response following each statement.

	Very important	Important	Less important	Not important	Undecided	
a. Compatibility to current land management plans	1	2	3	4	5	(a
b. Availability of technical assistance	1	2	3	4	5	(b
c. Availability of cost sharing practices	1	2	3	4	5	(c
d. Cost to you	1	2	3	4	5	(d
e. Profitability	1	2	3	4	5	(e
f. Control of soil erosion	1	2	3	4	5	(f
g. Improvement of water quality	1	2	3	4	5	(g
h. Availability of planning assistance	1	2	3	4	5	(h

12. Which of the above characteristics (letters a through h) are the most important to you? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____
Third choice_____

13. Following are reasons other landowners have given for participating in conservation programs. How important is each to you in deciding whether or not to participate in a conservation program? Please circle the most appropriate response following each statement.

	Very important	Important	Less important	Not important	Undecided	
a. To increase production	1	2	3	4	5	(a
b. To benefit wildlife	1	2	3	4	5	(b
c. To conserve soil	1	2	3	4	5	(c
d. Was persuaded by others	1	2	3	4	5	(d
e. To conserve land for family future	1	2	3	4	5	(e
f. To improve water quality	1	2	3	4	5	(f
g. Concerned about what neighbors think	1	2	3	4	5	(g
h. To be a good steward of the land	1	2	3	4	5	(h
i. Other (specify)_____						

14. Which of the above reasons (letters a through i) are the most important to you? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____
Third choice_____

15. Below are some types of assistance landowners have identified that they would be likely to use to improve wildlife habitat on their land. Please indicate how likely you would be to use each type of assistance.

	Very likely	Likely	Less likely	Not likely	
a. Free or low cost seed and plant materials	1	2	3	4	(a
b. Technical assistance	1	2	3	4	(b
c. Direct cash payments for maintenance of wildlife land	1	2	3	4	(c
d. Tax breaks for wildlife land	1	2	3	4	(d
e. Better trespass laws	1	2	3	4	(e
f. Increased law enforcement	1	2	3	4	(f
g. Farm and ranch wildlife specialists available through agencies	1	2	3	4	(g

16. From the above list of types of assistance (letters a through g), what would be your top two choices for assistance? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____

17. Below are 13 soil and wildlife conservation practices. Please indicate if you are already using these practices, willing or unwilling to use them, or if they do not apply to your type of operation.

	Already using	Willing to use	Unwilling to use	Does not apply	
a. Plant native warm season grasses for wildlife cover	1	2	3	4	(a
b. Retain existing woodlots	1	2	3	4	(b
c. Protect existing wetlands	1	2	3	4	(c
d. Allow land to revert to wildlife habitat	1	2	3	4	(d
e. Plant food plots for wildlife	1	2	3	4	(e
f. Leave 20' strips of grain next to fence rows and wooded areas for winter wildlife food	1	2	3	4	(f
g. Restrict grazing on woodlots and wooded areas	1	2	3	4	(g
h. Plant trees and shrubs for wildlife cover	1	2	3	4	(h
i. Fence farm ponds	1	2	3	4	(i
j. Leave 50% of annual growth on pasture and rangeland	1	2	3	4	(j
k. Overseed legumes in tame pastures	1	2	3	4	(k
l. Control burn to improve forage for livestock and wildlife	1	2	3	4	(l
m. Manage brush to leave clumps or strips of cover for wildlife	1	2	3	4	(m

18. If wildlife numbers increase on your land, more people may want access to your land for wildlife-related recreation. Below are some methods other landowners have suggested for dealing with increased public interest in private land access. Please indicate to what extent you agree or disagree with each method.

	Strongly agree	Agree	Disagree	Strongly disagree	Undecided	
a. Better trespass laws	1	2	3	4	5	(a
b. Lease agreements for wildlife recreation	1	2	3	4	5	(b
c. Mandatory hunter safety training	1	2	3	4	5	(c
d. Increased patrol and enforcement during peak use times	1	2	3	4	5	(d
e. Education for the public on landowner rights and public relations	1	2	3	4	5	(e
f. Posting land	1	2	3	4	5	(f
g. Closing land to the public	1	2	3	4	5	(g
h. Increased federal or state owned public recreation areas	1	2	3	4	5	(h
i. Access by permission only	1	2	3	4	5	(i

19. Which of the above methods (letters a through i) do you feel are the most useful to you? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____
Third choice_____

FARMING, RANCHING, & WILDLIFE

20. Below are statements and opinions expressed by other landowners. Please indicate to what extent you either agree or disagree with each statement.

	Strongly agree	Agree	Disagree	Strongly disagree	Undecided	
a. Seeing wildlife around my farm is important to me.	1	2	3	4	5	(a
b. Changes in farming over the last 10 years have not affected wildlife numbers in this area.	1	2	3	4	5	(b
c. Understanding and working with nature is an important reason I farm.	1	2	3	4	5	(c
d. I do not desire to have wildlife on my land.	1	2	3	4	5	(d
e. I believe conservation farming and ranching are good for wildlife and wildlife habitat.	1	2	3	4	5	(e
f. Farmers who enjoy wildlife sometimes choose economic gains over maintaining wildlife habitat.	1	2	3	4	5	(f
g. I try to consider wildlife habitat when I make a land use decision.	1	2	3	4	5	(g
h. I have enjoyed wildlife related recreation (hunting, fishing, birdwatching, etc.) on my land in the last five years.	1	2	3	4	5	(h

21. Please circle the number of any of the following organizations to which you belong:

1. Oklahoma Wildlife Federation
2. Farmer's Union
3. Oklahoma Cattleman's Association
4. National Wildlife Federation
5. National Audubon Society
6. Farm Bureau
7. Others (specify) _____

22. Please circle the number of any of the following magazines you read or subscribe to:

1. Oklahoma Farmer Stockman
2. National Geographic
3. Field and Stream
4. Sports Afield
5. Audubon
6. High Plains Journal
7. Southwest Farm Press
8. Outdoor Life
9. Progressive Farmer
10. National Wildlife
11. Outdoor Oklahoma
12. Other (specify)_____

BACKGROUND INFORMATION

To better understand your earlier responses, we need some background information. All information you provide will be kept strictly confidential. Please do not sign your name on this survey. Please circle the number which indicates your answer.

23. Were you reared on a farm or ranch? 1. yes 2. no

24. Please circle the number which represents your age category.

1. 18 - 28
2. 29 - 39
3. 40 - 50
4. 51 - 61
5. 62 - 72
6. 73 or more

25. Please circle the number which indicates the last year of formal education you completed:

1. grade 8 or less
2. more than 8, less than 12
3. high school diploma
4. some college
5. 2 year degree
6. 4 year degree
7. graduate work

26. Did you ever study any agriculture related subjects? 1. yes 2. no

27. Please circle the number which indicates the number of years you have been farming or ranching.

1. 5 or less
2. 6 - 12
3. 13 - 20
4. 21 - 31
5. 32 - 42
6. 43 years or more

28. Do you live east or west of Interstate 35? 1. east 2. west

29. Please circle the number which indicates the number of years you have been a conservation district cooperator.

1. 5 or less	4. 21 - 31
2. 6 - 12	5. 32 - 42
3. 13 - 20	6. 43 years or more

30. Please circle the number which indicates the number of years you or your family have operated the land (or major portion thereof) which you now operate.

1. 5 or less	4. 21 - 31
2. 6 - 12	5. 32 - 42
3. 13 - 20	6. 43 years or more

31. Do you intend to pass your farming or ranching on to your family? 1. yes 2. no

32. Did you and/or your family provide at least 50% of the labor on your farm in 1984? 1. yes 2. no

33. What percent of your total family income do you receive from farming?

1. 1 - 25 %	3. 51 - 75 %
2. 26 - 50 %	4. 76 - 100 %

34. Are you employed off the farm? 1. yes 2. no

35. Please write the name of the county in which most of your land is located in this blank. _____county

36. How would you describe the area where your land is located (circle only one).

1. rural
2. within 10 miles of a small town (5,000 - 15,000 pop.)
3. within 10 miles of a town (15,001 - 30,000 pop.)
4. within 10 miles of a city (30,001 - 45,000 pop.)
5. within 10 miles of a large city (45,001 + pop.)

37. Do you reside on the land that you farm or ranch? 1. yes 2. no

38. If the answer to question 37 is no, how often do you visit the land?

1. daily
2. weekly
3. monthly
4. several times a year
5. once a year or less

39. How many acres do you operate?

1. less than 80 acres	4. 321 - 640 acres
2. 81 - 160 acres	5. 641 - 800 acres
3. 161 - 320 acres	6. more than 800 acres

Thank you for taking time to fill out this survey. If you have additional comments concerning conservation agriculture and wildlife, please feel free to use the back of this sheet. Thanks again!

APPENDIX B

WEIGHTED VALUES FOR QUESTIONNAIRE RESPONSES

WEIGHTED VALUES FOR QUESTIONNAIRE RESPONSES

Question 1					
Choices:	ALL	MOST	SOME	NONE	DATA
Responses Numbered:	1	2	3	4	5
Responses Weighted: a.	5	4	2	1	3
b.	1	2	4	5	3
If question 28 is 1, then b is:	1	2	5	4	3
c.	1	2	4	5	3
d.	5	4	2	1	3
e.	5	5	5	2	3
f.	2	2	4	4	3
g.	5	4	2	1	3
h.	1	1	2	5	3
i.	5	4	4	1	3
j.	1	1	2	5	3
If question 28 is 1, then j is:	1	2	5	4	3
k.	1	1	1	4	3
If question 28 is 1, then k is:	1	2	5	4	3
l.	1	2	4	5	3
m.	1	2	4	5	3
n.	5	4	2	1	3

Note: Add 2 points to individual score for any item checked 1 in question 17.

Question 2				
Responses numbered:	1	2	3	4
Responses weighted:	-1	4	5	0

Question 3					
Responses numbered:	1	2	3	4	5
Responses weighted:	1	2	4	5	3

Question 4

Responses numbered:	1	2	3	4	5
Responses weighted:	1	2	4	5	3

Question 5

Responses numbered:	1	2	3	4	5
Responses weighted:	1	1	1	5	5

Question 6

Responses numbered:	1	2	
Responses weighted:	4	1	

Question 7

Responses numbered:	1	2	(frequency)

Question 8

Responses numbered:	1	2	3	4	(frequency)

Question 9

Responses numbered:	1	2	3	4	5
Responses weighted (a through k):	4	3	2	1	0

Question 10

First choice
Second choice
Third choice

(frequency and ranking of responses)

Question 11

Responses numbered:	1	2	3	4	5
Responses weighted (a through h):	5	4	2	1	3

Question 12

First choice
Second choice
Third choice

(frequency and ranking of responses)

Question 13

Responses numbered:	1	2	3	4	5
Responses weighted (a through h):	5	4	2	1	3

Question 14

First choice
Second choice
Third choice

(frequency and ranking of responses)

Question 15

Responses numbered:	1	2	3	4
Responses weighted (a through g):	4	3	2	1

Question 16

First choice (frequency of response
Second choice and ranking)

Question 17

Responses numbered:	1	2	3	4
Responses weighted:	2	2	1	0

Note: Any item checked in column 1 adds 2 points to score of question 1.

Question 18

Responses numbered:	1	2	3	4	5
Responses weighted:	5	4	2	1	3

Question 19

First choice (frequency of response
Second choice and ranking)
Third choice

Question 20

Responses numbered:	1	2	3	4	5
Responses weighted:					
a,c,e,f,g,h:	5	4	2	1	3
d:	1	2	4	5	3
b:	frequency of response				

Question 21

frequency of response only

Question 22

frequency of response only

Questions 23 through 43: Demographic data
Actual acreages punched on 40, 41, and 42.

APPENDIX C

COVER LETTER, ART WORK, SURVEY

LEONARD A. SOLOMON
Executive Director

ROBERT W. TOOLE
Assistant Director

OKLAHOMA CONSERVATION COMMISSION
2800 NORTH LINCOLN BOULEVARD
SUITE 160
OKLAHOMA CITY, OKLAHOMA 73105
PHONE 521-2384

March 8, 1985

Dear Conservation District Director:

You have been selected to participate in a statewide survey of Conservation District Directors. The survey will collect information on conservation practices and assistance programs. It will also gather information on conservation farming and ranching and on wildlife in our state. We will analyze the results of this survey and that information will be used to better serve you and the Conservation Districts, as well as to assist us as we work with other conservation agencies and organizations. Only a limited number of Directors are being surveyed. This makes your individual response to this survey very important.

Will you please complete the enclosed questionnaire and return it in the enclosed postage paid envelop by **March 25, 1985**. All information that you provide is strictly confidential. Please do not sign your survey.

Your opinion and response are very important to us. Thank you for taking 20 minutes of your valuable time to help us in this important task. We appreciate your committment to keeping Oklahoma's conservation program the best in the nation.

Sincerely,

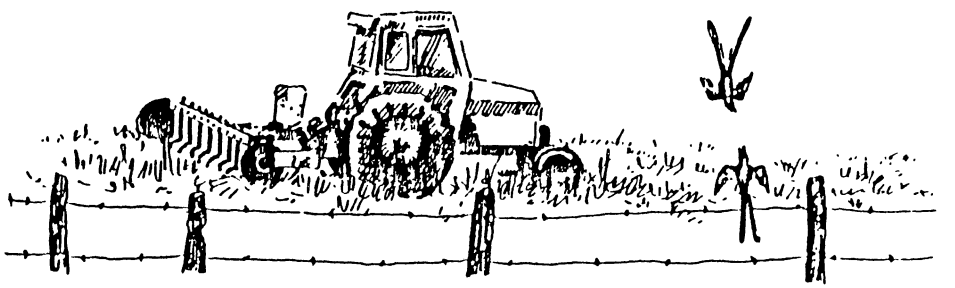
Leonard A. Solomon

LEONARD A. SOLOMON
Executive Director

LAS/DAS:CRW
Enclosures

CONSERVATION AGRICULTURE & WILDLIFE

a survey of Oklahoma landowners



IN COOPERATION WITH

OKLAHOMA'S CONSERVATION DISTRICTS
AND
THE OKLAHOMA CONSERVATION COMMISSION

MARCH 1985

CONSERVATION AGRICULTURE AND WILDLIFE SURVEY

Following is a series of questions and statements concerning conservation programs, wildlife resources, and conservation practices. Please circle the response that best fits your feeling about each item. An example has been provided for your help.

SAMPLE STATEMENT	Strongly agree	Agree	Disagree	Strongly disagree	Undecided	
a. Oklahoma is a great state.	(1)	2	3	4	5	(a

The person who answered this statement strongly agreed with the statement.

PRACTICES

The following questions deal with farm and ranch practices you are using on your land. Please circle the most appropriate response following each question.

1. In the last 10 years, have you:	All	Most	Some	None	Does not apply	
a. increased the size of your individual fields?	1	2	3	4	5	(a
b. controlled any brush on your land?	1	2	3	4	5	(b
c. removed any windbreaks on your land?	1	2	3	4	5	(c
d. planted any windbreaks on your land?	1	2	3	4	5	(d
e. fenced any of your farm ponds?	1	2	3	4	5	(e
f. regularly mowed any of your roadsides?	1	2	3	4	5	(f
g. regularly left any odd areas in natural vegetation?	1	2	3	4	5	(g
h. removed any vegetation and trees along creek banks?	1	2	3	4	5	(h
i. established legumes in your pasture?	1	2	3	4	5	(i
j. converted woodland to pasture?	1	2	3	4	5	(j
k. converted woodland to cropland?	1	2	3	4	5	(k
l. converted rangeland to pasture?	1	2	3	4	5	(l
m. converted rangeland to cropland?	1	2	3	4	5	(m
n. converted cropland to pasture?	1	2	3	4	5	(n

2. Circle the number which corresponds to your primary method of tillage.

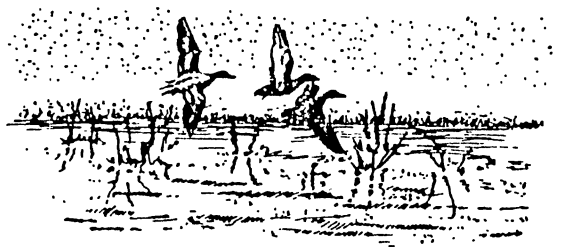
1. moldboard plow
2. stubble mulching
3. "no-till"/minimum tillage
4. other (specify)_____

	Always	Most of the time	Seldom	Never	Does not apply
3. If you have rangeland, do you generally remove more than 50% of the annual growth?	1	2	3	4	5
4. If you have pastureland, do you generally remove more than 50% of the annual growth?	1	2	3	4	5
5. If you have woodland, do you generally allow livestock to graze your woodland?	1	2	3	4	5

	Yes	No
6. Is improving or maintaining wildlife habitat a part of your district/SCS conservation plan?	1	2
7. Is any of your land posted?	1	2

8. To what extent has maintaining wildlife habitat on your land limited your farming or ranching operation? (circle the number)

1. severe limitations
2. moderate limitations
3. few limitations
4. no limitations



PROGRAM

9. Below are some factors which farmers and ranchers have said affect their farm and ranch planning. Please indicate by circling the appropriate number the importance of each to your 3 to 5 year farm or ranch plan.

	Very important	Important	Less important	Not important	Does not apply	
a. Commodity markets (futures)	1	2	3	4	5	(a
b. USDA policy	1	2	3	4	5	(b
c. Your debt load	1	2	3	4	5	(c
d. ASCS assistance programs	1	2	3	4	5	(d
e. Livestock markets	1	2	3	4	5	(e
f. Interest rates	1	2	3	4	5	(f
g. Weather	1	2	3	4	5	(g
h. Availability of machinery/equipment	1	2	3	4	5	(h
i. Risk	1	2	3	4	5	(i
j. Local markets	1	2	3	4	5	(j
k. International markets	1	2	3	4	5	(k

10. Which of the above factors (letters a through k) are the most important to you? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____
Third choice_____

11. Following are some general characteristics of assistance programs offered by conservation agencies. How important do you consider each one to be when you are deciding whether or not to participate in a conservation program? Please circle the most appropriate response following each statement.

	Very important	Important	Less important	Not important	Undecided	
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b. Availability of technical assistance	1	2	3	4	5	(b
c. Availability of cost sharing practices	1	2	3	4	5	(c
d. Cost to you	1	2	3	4	5	(d
e. Profitability	1	2	3	4	5	(e
f. Control of soil erosion	1	2	3	4	5	(f
g. Improvement of water quality	1	2	3	4	5	(g
h. Availability of planning assistance	1	2	3	4	5	(h

12. Which of the above characteristics (letters a through h) are the most important to you? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____
Third choice_____

13. Following are reasons other landowners have given for participating in conservation programs. How important is each to you in deciding whether or not to participate in a conservation program? Please circle the most appropriate response following each statement.

	Very important	Important	Less important	Not important	Undecided	
a. To increase production	1	2	3	4	5	(a
b. To benefit wildlife	1	2	3	4	5	(b
c. To conserve soil	1	2	3	4	5	(c
d. Was persuaded by others	1	2	3	4	5	(d
e. To conserve land for family future	1	2	3	4	5	(e
f. To improve water quality	1	2	3	4	5	(f
g. Concerned about what neighbors think	1	2	3	4	5	(g
h. To be a good steward of the land	1	2	3	4	5	(h
i. Other (specify)_____						

14. Which of the above reasons (letters a through i) are the most important to you? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____
Third choice_____

15. Below are some types of assistance landowners have identified that they would be likely to use to improve wildlife habitat on their land. Please indicate how likely you would be to use each type of assistance.

	Very likely	Likely	Less likely	Not likely	
a. Free or low cost seed and plant materials	1	2	3	4	(a
b. Technical assistance	1	2	3	4	(b
c. Direct cash payments for maintenance of wildlife land	1	2	3	4	(c
d. Tax breaks for wildlife land	1	2	3	4	(d
e. Better trespass laws	1	2	3	4	(e
f. Increased law enforcement	1	2	3	4	(f
g. Farm and ranch wildlife specialists available through agencies	1	2	3	4	(g

16. From the above list of types of assistance (letters a through g), what would be your top two choices for assistance? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____

17. Below are 13 soil and wildlife conservation practices. Please indicate if you are already using these practices, willing or unwilling to use them, or if they do not apply to your type of operation.

	Already using	Willing to use	Unwilling to use	Does not apply	
a. Plant native warm season grasses for wildlife cover	1	2	3	4	(a
b. Retain existing woodlots	1	2	3	4	(b
c. Protect existing wetlands	1	2	3	4	(c
d. Allow land to revert to wildlife habitat	1	2	3	4	(d
e. Plant food plots for wildlife	1	2	3	4	(e
f. Leave 20' strips of grain next to fence rows and wooded areas for winter wildlife food	1	2	3	4	(f
g. Restrict grazing on woodlots and wooded areas	1	2	3	4	(g
h. Plant trees and shrubs for wildlife cover	1	2	3	4	(h
i. Fence farm ponds	1	2	3	4	(i
j. Leave 50% of annual growth on pasture and rangeland	1	2	3	4	(j
k. Overseed legumes in tame pastures	1	2	3	4	(k
l. Control burn to improve forage for livestock and wildlife	1	2	3	4	(l
m. Manage brush to leave clumps or strips of cover for wildlife	1	2	3	4	(m

18. If wildlife numbers increase on your land, more people may want access to your land for wildlife-related recreation. Below are some methods other landowners have suggested for dealing with increased public interest in private land access. Please indicate to what extent you agree or disagree with each method.

	Strongly agree	Agree	Disagree	Strongly disagree	Undecided	
a. Better trespass laws	1	2	3	4	5	(a
b. Lease agreements for wildlife recreation	1	2	3	4	5	(b
c. Mandatory hunter safety training	1	2	3	4	5	(c
d. Increased patrol and enforcement during peak use times	1	2	3	4	5	(d
e. Education for the public on landowner rights and public relations	1	2	3	4	5	(e
f. Posting land	1	2	3	4	5	(f
g. Closing land to the public	1	2	3	4	5	(g
h. Increased federal or state owned public recreation areas	1	2	3	4	5	(h
i. Access by permission only	1	2	3	4	5	(i

19. Which of the methods in question 18 (letters a through i) do you feel are the most useful to you? (Please write the appropriate letter in the blank.)

First choice_____
Second choice_____
Third choice_____

FARMING, RANCHING, & WILDLIFE

20. Below are statements and opinions expressed by other landowners. Please indicate to what extent you either agree or disagree with each statement.

	Strongly agree	Agree	Disagree	Strongly disagree	Undecided	
a. Seeing wildlife around my farm is important to me.	1	2	3	4	5	(a
b. Changes in farming over the last 10 years have not affected wildlife numbers in this area.	1	2	3	4	5	(b
c. Understanding and working with nature is an important reason I farm.	1	2	3	4	5	(c
d. I do not desire to have wildlife on my land.	1	2	3	4	5	(d
e. I believe conservation farming and ranching are good for wildlife and wildlife habitat.	1	2	3	4	5	(e
f. Farmers who enjoy wildlife sometimes choose economic gains over maintaining wildlife habitat.	1	2	3	4	5	(f
g. I try to consider wildlife habitat when I make a land use decision.	1	2	3	4	5	(g
h. I have enjoyed wildlife related recreation (hunting, fishing, birdwatching, etc.) on my land in the last five years.	1	2	3	4	5	(h

21. Please circle the number of any of the following organizations to which you belong:

1. Oklahoma Wildlife Federation
2. Farmer's Union
3. Oklahoma Cattleman's Association
4. National Wildlife Federation
5. National Audubon Society
6. Farm Bureau
7. Others (specify) _____

22. Please circle the number of any of the following magazines you read or subscribe to:

1. Oklahoma Farmer Stockman
2. National Geographic
3. Field and Stream
4. Sports Afield
5. Audubon
6. High Plains Journal
7. Southwest Farm Press
8. Outdoor Life
9. Progressive Farmer
10. National Wildlife
11. Outdoor Oklahoma
12. Other (specify)_____

BACKGROUND INFORMATION

To better understand your earlier responses, we need some background information. All information you provide will be kept strictly confidential. Please do not sign your name on this survey. Please circle the number which indicates your answer.

23. Were you reared on a farm or ranch? 1. yes 2. no

24. Please circle the number which represents your age category.

1. 18 - 28
2. 29 - 39
3. 40 - 50
4. 51 - 61
5. 62 - 72
6. 73 or more

25. Please circle the number which indicates the last year of formal education you completed:

1. grade 8 or less
2. more than 8, less than 12
3. high school diploma
4. some college
5. 2 year degree
6. 4 year degree
7. graduate work

26. Did you ever study any agriculture related subjects? 1. yes 2. no

27. Please circle the number which indicates the number of years you have been farming or ranching.

1. 5 or less
2. 6 - 12
3. 13 - 20
4. 21 - 31
5. 32 - 42
6. 43 years or more

28. Do you live east or west of Interstate 35? 1. east 2. west

29. Please circle the number which indicates the number of years you have been a conservation district cooperator.

1. 5 or less
2. 6 - 12
3. 13 - 20
4. 21 - 31
5. 32 - 42
6. 43 years or more

30. Please circle the number which indicates the number of years you or your family have operated the land (or major portion thereof) which you now operate.

1. 5 or less
2. 6 - 12
3. 13 - 20
4. 21 - 31
5. 32 - 42
6. 43 years or more

31. Do you intend to pass your farming or ranching on to your family? 1. yes 2. no

32. Did you and/or your family provide at least 50% of the labor on your farm in 1984? 1. yes 2. no

33. What percent of your total family income do you receive from farming?

1. 1 - 25 %
2. 26 - 50 %
3. 51 - 75 %
4. 76 - 100 %

34. Are you employed off the farm? 1. yes 2. no

35. Please write the name of the county in which most of your land is located in this blank. _____county

36. How would you describe the area where your land is located (circle only one).

1. rural
2. within 10 miles of a small town (5,000 - 15,000 pop.)
3. within 10 miles of a town (15,001 - 30,000 pop.)
4. within 10 miles of a city (30,001 - 45,000 pop.)
5. within 10 miles of a large city (45,001 + pop.)

37. Do you reside on the land that you farm or ranch? 1. yes 2. no

38. If the answer to question 37 is no, how often do you visit the land?

1. daily
2. weekly
3. monthly
4. several times a year
5. once a year or less

39. How many acres do you operate?

1. less than 80 acres
2. 81 - 160 acres
3. 161 - 320 acres
4. 321 - 640 acres
5. 641 - 800 acres
6. more than 800 acres

40. How much of the land you operate do you own? _____acres

41. How much of the land you operate do you rent/lease? _____acres

42. How much land do you own which you lease to someone else? _____acres

43. Please circle the number of the item which best describes your operation:

1. Cash grain farm (sorghum, wheat, soybeans, oats, etc.)
2. Cotton farm
3. Other field crop farm (peanuts, etc.)
4. Livestock farm or ranch (sheep, cattle, dairy, swine, poultry)
5. Combination livestock and grain farm
6. Tree farm
7. Other (specify)_____

Thank you for taking time to fill out this survey. If you have additional comments concerning conservation agriculture and wildlife, please feel free to use the back of this sheet. Thanks again!

VITA 2

Dan Alvin Sebert

Candidate for the Degree of

Doctor of Philosophy

Thesis: WILDLIFE HABITAT ON PRIVATE LANDS: OKLAHOMA CONSERVATION DISTRICT COOPERATOR ATTITUDES, PERCEPTIONS, AND PREFERENCES

Major Field: Environmental Science

Biographical:

Personal Data: Born in Clinton, Oklahoma, March 10, 1950, the son of Dr. Clarence Alvin Sebert, D.D.S. and Billie Louise Poling Sebert.

Education: Graduated from Clinton High School, Clinton, Oklahoma, in 1968; received the Bachelor of Science in Natural Science from Oklahoma Baptist University, Shawnee, Oklahoma, with a major in Biology in 1972; received the Master of Education Degree from East Central University, Ada, Oklahoma, with a major in Biological Science in July 1979; attended Oklahoma State University from January, 1981, until July, 1985; completed the requirements for the Doctor of Philosophy Degree at Oklahoma State University in July, 1985.

Professional Experience: Science Instructor and head football coach, Shawnee Junior High School, Shawnee, Oklahoma, 1972-1975; Conservation Education Specialist, Ponotoc County Conservation District, Ada, Oklahoma, 1975-1977; Conservation Education Specialist, Oklahoma Conservation Commission, 1977-1980; adjunct faculty member, Natural Resources and Environmental Education Center, Oklahoma State University, Stillwater, Oklahoma, 1980-1983; State Education Coordinator, Oklahoma Conservation Commission, Stillwater, Oklahoma, 1980-1985.

Member: Phi Kappa Phi Honor Society, The Wildlife Society, Soil Conservation Society of America, and the Conservation Education Association.