

AN EVALUATION OF WILDLIFE ENHANCEMENT ACTIVITIES
IN THE RESIDENTIAL CONTEXT

By

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PREFACE

As urbanization and habitat destruction continue, interest in urban wildlife habitat has increased. One type of urban habitat with potential for wildlife is residential habitat. The purpose of this study was to examine household involvement in residential wildlife attraction activities, which included examination of participation in these activities and participants' perception of these activities. Funding for this study was provided by the National Wildlife Federation's Conservation Fellowship Program and the Oklahoma Cooperative Wildlife Research Unit.

The objectives of this study were to evaluate household participation in attraction of wildlife to residential habitat, methods used to attract wildlife, participants' perceptions of success at attraction attempts, and problems and needs of individuals attracting wildlife to their residence.

The following report was prepared as four separate and complete manuscripts to facilitate submission to scientific journals for publication. Each manuscript represents a chapter in the report. The manuscripts entitled "Methods of Residential Wildlife Attraction", "Predation on Residential Wildlife", and "Wildlife Enhancement Activities in Stillwater, Oklahoma" were written in the style of the WILDLIFE SOCIETY BULLETIN. The manuscript entitled "Perceptions of a Residential Wildlife Program" was written in the style of the TRANSACTIONS OF THE

NORTH AMERICAN WILDLIFE AND NATURAL RESOURCES CONFERENCE.

I wish to express my gratitude to my major adviser, Dr. John S. Barclay, for his guidance and support throughout this study. I would like to thank my committee members, Drs. John Bissonette, Stanley Fox, Larry Talent, and William Warde for their assistance in the planning, analysis, and reporting of this study.

Sincere thanks are expressed to fellow graduate students who have come and gone during my stay at Oklahoma State University. Their assistance, suggestions, and friendship kept me going. Thanks are also due to Mary Batcheller, Vicki Clark, and Janice Green, for their help with the preparation of survey materials.

Appreciation is expressed to Craig Tufts of the National Wildlife Federation for his help with the survey of backyard wildlife program participants. Thanks are also due to Stillwater residents and backyard wildlifers who took the time to respond to mail surveys and cooperated during personal interviews.

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CHAPTER I

METHODS OF RESIDENTIAL WILDLIFE ATTRACTION

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Abstract: A questionnaire survey was used to examine methods of attracting wildlife to residential areas. The 1347 individuals surveyed were known to be involved in wildlife attraction activities. Eight hundred and sixty two questionnaires were returned for a response rate of 64%. Supplemental feeding and watering were the most common methods of wildlife attraction used by respondents. However, 88% reported using at least 5 different methods to attract wildlife. Respondents spent much time and money on wildlife attraction. Most respondents rated themselves successful at attraction attempts. Types of assistance that would be valuable to respondents were solving conflicts between cats and wildlife, controlling wildlife pests, meeting expenses of wildlife attraction, and attracting particular wildlife species.

Activities designed to attract wildlife to residential areas are an asset to wildlife conservation programs. Not only is new habitat created for "man-tolerant" species, but in addition city residents are brought in touch with wildlife and natural systems. Residential wildlife may bring the benefits of enjoyment, beauty, and education to city residents (Yeomans 1981). Wildlife attraction activities are

economically important. Payne and DeGraaf (1975) estimated that nationwide actual sales of birdseed in 1974 were \$170 million and estimated sales of birdhouses and feeders in 1974 at \$15 million.

Several studies have examined wildlife attraction activities in residential areas. Cauley (1974: 46) found that 72% of the persons interviewed in a suburban Detroit area fed wildlife, 24% had bird baths, and 28% had birdhouses. A survey conducted in Waterloo Ontario by Dagg (1970) revealed that 15% of the respondents used a feeder, 48% sometimes fed birds, and 37% never fed birds. Szot (1975: 98-99) conducted personal interviews in 5 different residential areas in Tucson, Arizona. Percentages of respondents feeding birds in these 5 areas ranged from 40% to 84%. Forty to forty eight percent of the respondents fed animals other than birds and 64% to 88% of the respondents provided water for wildlife.

Previous work dealing with wildlife attraction activities examined the activities of the general public in a particular location. We wished to examine wildlife attraction activities of a group of individuals who were known to be interested and involved in encouraging residential wildlife. Involvement in wildlife attraction activities should be better characterized by individuals who are known to be involved in these activities than by the general public. Information from individuals actively involved in encouraging wildlife should help wildlife biologists provide more effective assistance to persons interested in attracting residential wildlife.

Participants in the National Wildlife Federation's (NWF) backyard wildlife program were selected as an "involved" study population. Backyard referred to the area around a residence, which may range in

size from a 3 acre lot to a window box planter. Applicants with property exceeding 3 acres were encouraged to extend habitat development. The NWF's backyard wildlife program is a certification program. An applicant is required to complete a detailed application requesting information on backyard vegetation, availability of water, methods used to attract wildlife, and wildlife species observed. Since obtaining certification involved considerable effort on the part of the applicant, we assumed that persons involved in this program were interested in and actively involved in encouraging residential wildlife.

We wish to thank W.D. Warde for assistance with statistical analysis. Appreciation is also expressed to Craig Tufts of the National Wildlife Federation for his help with this survey. This study was funded in part through the National Wildlife Federation's Conservation Fellowship Program and the Oklahoma Cooperative Wildlife Research Unit.

METHODS

A questionnaire survey was conducted to examine involvement in attraction of wildlife to residential habitat. A 6 page questionnaire (Appendix C) was developed and sent to the 1347 known participants in the NWF's backyard wildlife program in October of 1979. The questionnaire consisted primarily of structured questions, but space was available for additional comments. Letters explaining the purpose of the study and postage-paid return envelopes were mailed with the questionnaires. The Statistical Analysis System's computer packages (Barr et al. 1979) were used to compute the frequency of all responses and to conduct chi-square analyses of selected data.

RESULTS AND DISCUSSION

Questionnaires were mailed to the 1347 current members of the NWF's backyard wildlife program in October of 1979. Eight hundred and sixty two questionnaires were completed and returned, for a response rate of 64%. The typical survey respondent was highly educated (66% had completed some college or professional school) lived in a self-owned home (98%) and was highly motivated regarding residential wildlife (57% spent over 100 dollars per year). The average size of a respondents' backyard was 3.5 acres (1.44 ha) with a range of 0.02 to 125 acres (0.008 to 50.59 ha). These properties were located both inside (47%) and outside (53%) city limits.

Survey participants were asked which wildlife groups they encouraged at their residences. All of the respondents encourage birds at their residence, 80% encourage mammals, 63% encouraged amphibians, and 49% encouraged reptiles.

Respondents had been encouraging wildlife at their residences for an average of 12½ years. Forty two percent of the respondents had spent \$100 or less per year on wildlife attraction activities, 21% had spent between \$101 and \$200, 15% had spent between \$201 and \$300, and 21% had spent over \$300 (Figure 1). The amount of time and money spent by respondents for wildlife attraction indicated a high level of interest and involvement in residential wildlife.

Respondents used several methods to attract wildlife to their residence (Figure 2). Eighty eight percent of the respondents used 5 or more different attraction methods. The attraction method used most frequently by respondents was providing supplemental food for wildlife (98%). Premixed wild birdseed was made available to wildlife by 86% of

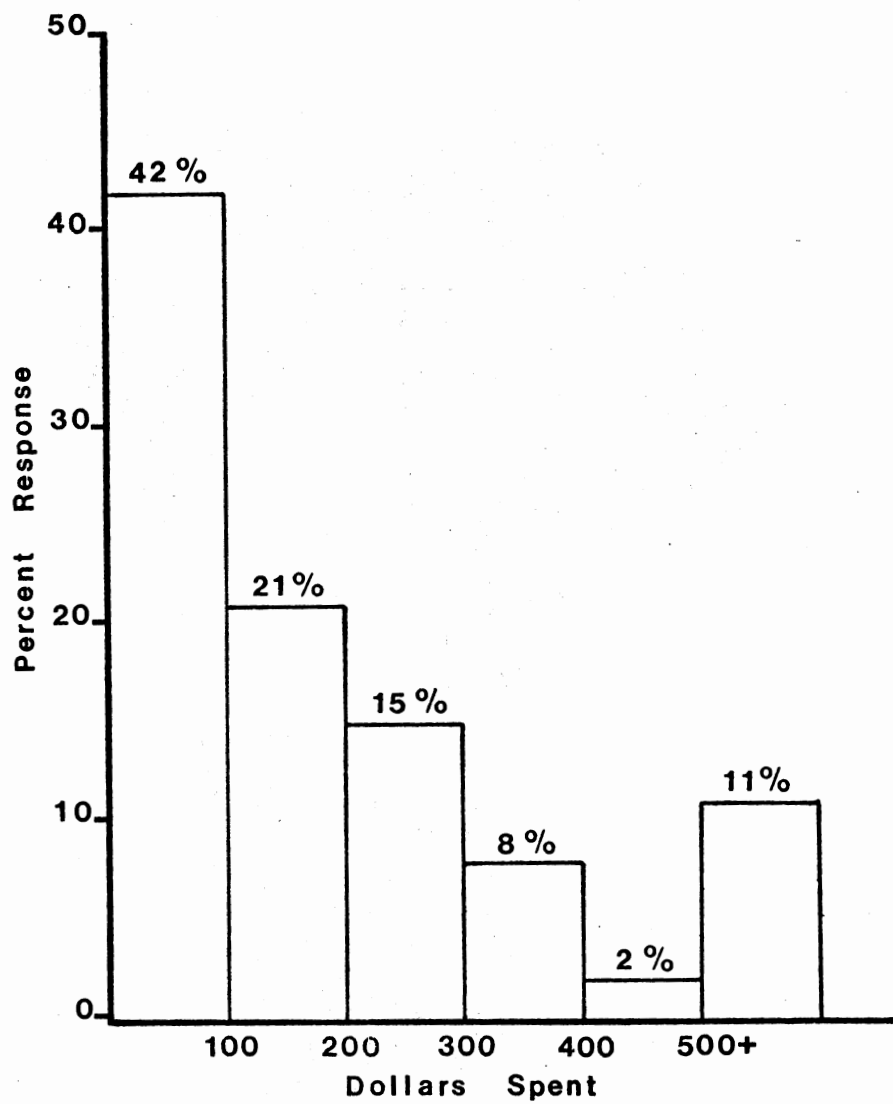


Fig. 1. Survey respondents' yearly expenditures for residential wildlife attraction.

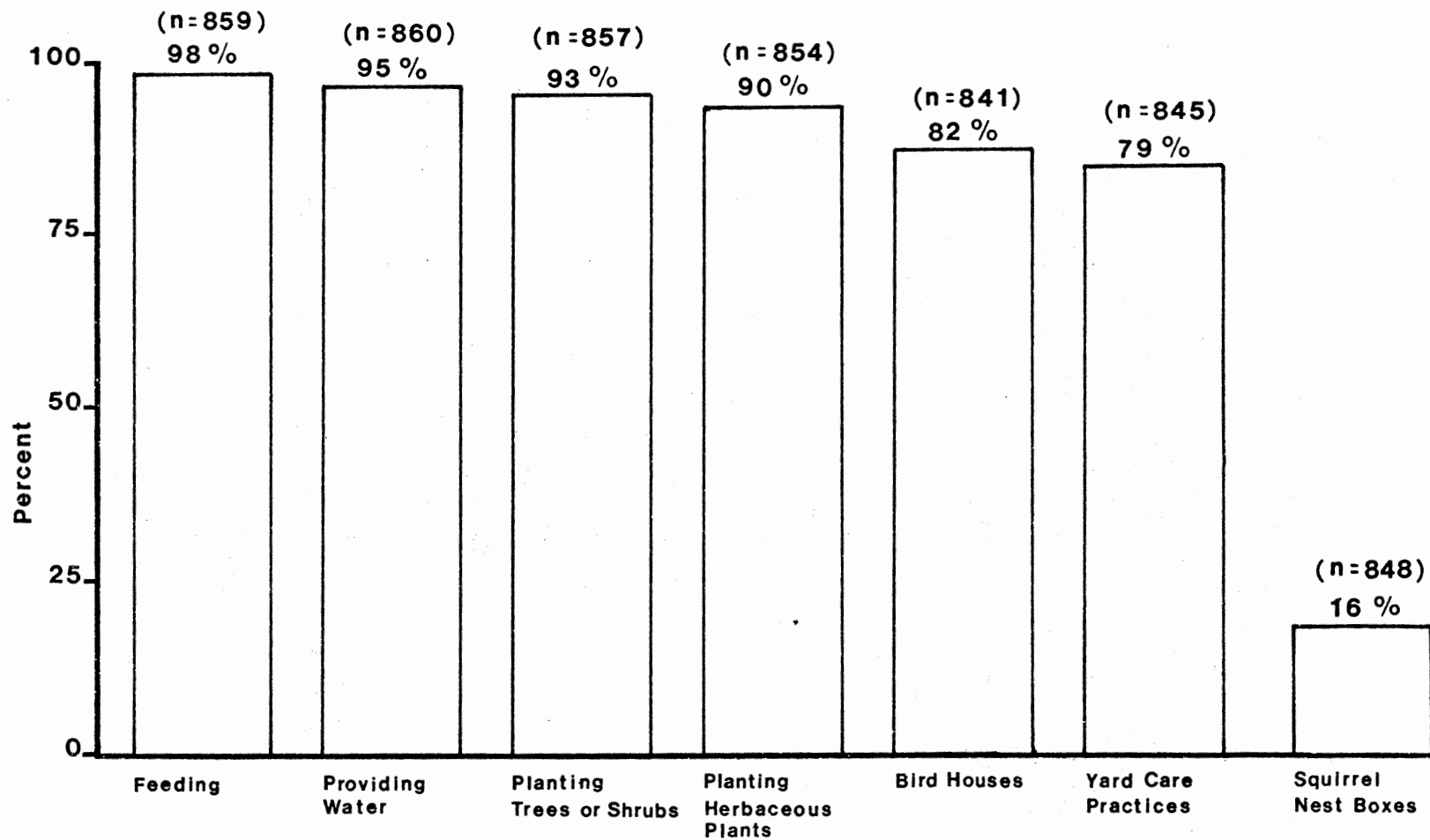


Fig. 2. Methods used by survey respondents to attract residential wildlife (n refers to the total number of respondents answering a particular question).

the respondents, suet or fat by 78%, and corn by 53%. Fifty percent of the respondents fed bakery products to wildlife and 49% fed table scraps.

Ninety five percent of the respondents provided water for wildlife. Ninety seven percent of these respondents made water available in the summer, 95% provided water in both the spring and fall, and 75% in the winter. Bird baths were used most often, while other methods respondents used included placing a pan or other container of water on the ground or on blocks (40%) and building a pond (29%). Fifteen percent of the respondents heated bird baths in the winter.

Eighty two percent of the respondents made birdhouses or nesting structures available to wildlife at their residence. Eighty four percent of the respondents with birdhouses claimed active birdhouses in 1979 with an average of 4 active birdhouses per residence. Sixteen percent of the respondents provided nest boxes for squirrels of which 80% reported an average of 2 active nest boxes during 1979.

Respondents made use of landscaping activities such as planting various types of vegetation (97%) and making changes in lawn and yard care practices (79%). Those activities in the latter category included self-limiting of pesticide use (88%), allowing flowers and weeds to go to seed (83%), and making brush piles (73%) and/or compost piles (60%). Most respondents planted trees and shrubs with wildlife considerations in mind. Ninety three percent of the respondents planted trees and/or shrubs. Herbaceous plants were planted by 90% of the respondents.

The use of many different methods to attract wildlife appeared indicative of a high level of involvement in residential wildlife attraction. A possible problem with the use of wildlife attraction methods as a measure of involvement in wildlife attraction activities

could occur when adequate wildlife habitat occurred naturally at a residence, was developed by previous owners, or when non-home owning participants were unable to modify the habitat. Examination of the use of landscaping to attract wildlife had inherent problems since it is difficult to tell whether or not wildlife is being considered in the planning process.

Respondents were asked to rate the effectiveness of their attempts to attract wildlife to their residence. Forty five percent of the respondents rated themselves highly successful at attracting wildlife to their residence, 54% rated themselves fairly successful, and only 1% said they were unsuccessful, which is not surprising in view of inherent biases. Chi-square analyses were conducted in an attempt to determine what factors had an effect on how respondents rated their success at wildlife attraction. These tests showed that the respondents who were more successful at wildlife attraction were more likely to:

- (1) encourage mammals ($P = .0184$), reptiles ($P = .0030$), and amphibians ($P = .003$),
- (2) spend more money attracting wildlife ($P = .0001$),
- (3) use more bird houses ($P = .0002$).

Types of assistance that should help respondents attract wildlife were identified. Nearly a third stated a desire for assistance in solving conflicts between cats and wildlife (29%), while controlling wildlife pests, meeting expenses of wildlife attraction, and acquiring information on attracting particular wildlife species was of interest to a smaller group (1%). Examination of other responses revealed a general need for information on the use of natural vegetation to provide food and cover for wildlife and on providing water for wildlife during the

winter.

CONCLUSIONS

The population surveyed consisted of individuals known to be involved in wildlife attraction activities. The survey respondents used several different attraction methods in an attempt to entice a variety of wildlife to their residences. The wildlife attraction methods used most often by respondents were providing supplemental food and water. Additional methods were used by many of the respondents. Respondents spent much time and money on wildlife attraction. Most respondents rated themselves successful at wildlife attraction. Examination of survey responses revealed a desire for assistance in solving conflicts between cats and wildlife, controlling wildlife pests, acquiring information on attracting particular wildlife species, and meeting attraction expenses. Information gained from studies such as this should help wildlife biologists assist individuals involved in residential wildlife attraction and also help others develop an interest in these activities.

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CHAPTER II

PERCEPTIONS OF A RESIDENTIAL WILDLIFE PROGRAM

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Abstract

Development of habitat for wildlife in urban areas is considered by some to be at least a partial solution to problems facing wildlife today. This includes both the view that urban habitat is a "last refuge" for certain wildlife species in the face of diminishing natural habitat and the view that wildlife in the urban environment can help put urban residents back in touch with natural systems. One type of urban habitat with potential for wildlife aggregations is the residential or "backyard" habitat. When considering utilization of residential habitat for wildlife, it is important to know how man will react to the development of habitat at his residence and to any wildlife attracted.

A nationwide survey was conducted to examine perceptions of residential wildlife programs. Questionnaires were mailed to 1347 known participants in the National Wildlife Federation's backyard wildlife program (participation in this program probably indicates a high level of interest in residential wildlife attraction since it requires completion of a detailed application in order to obtain certification of one's residence as wildlife habitat). A response rate

of 64 percent was obtained in this survey. Examination of characteristics of participants revealed that 98 percent owned their homes, 66 percent had completed some college or professional school, and 24 percent were retired. The average size of participants' backyards was 3.5 acres.

Survey respondents indicated that the chief benefits of attracting wildlife to one's residence were enjoyment (99 percent), beauty of wildlife attracted (92 percent), satisfaction of helping wildlife survive the winter (91 percent), and the educational value for children of a more "natural" setting (86 percent). Respondents having difficulty attracting wildlife determined the major causes to be dogs and cats scaring wildlife (61 percent) and attracting undesirable wildlife species (38 percent). Problems attributed to wildlife appeared to be of a minor nature to respondents, with most problems attributed to starlings (30 percent), house sparrows (24 percent), moles (23 percent), and squirrels (22 percent). Respondents desired assistance in solving conflicts between cats and wildlife (29 percent), controlling wildlife pests (1 percent), and acquiring information on attracting particular wildlife species (1 percent). When asked to rate the success of their attraction attempts, 54 percent of the respondents said they were fairly successful and 45 percent said they were highly successful.

INTRODUCTION

Urban habitat is thought by some to be a "last refuge" for certain wildlife species in the face of diminishing natural habitat. Urban wildlife can also benefit urbanites by putting them back in touch with nature (Allen 1974). One type of urban habitat with potential for

wildlife aggregations is residential or "backyard" habitat. It is important to know how man will react to the development of habitat at his residence and to any wildlife attracted, when considering utilization of residential habitat for wildlife.

Several studies have examined human behavior, attitudes and responses toward urban wildlife. Dagg (1970) examined the reactions of residents of Waterloo, Ontario towards urban wildlife. Cauley (1974) surveyed a Detroit suburban area. Shaar (1979) examined attitudes of residents in the Quebec City region towards urban wildlife. Brown et al. (1979) examined wildlife interests and attitudes of metropolitan New York residents. These studies involved sampling the general public in a particular area about urban wildlife.

Our definition of urban wildlife was restricted to residential wildlife in both rural and urban areas, and we restricted the general public to individuals involved in programs to encourage residential wildlife by making food, water, and/or cover available to their residence. The purpose of our study was to examine how individuals actively involved in programs to encourage wildlife were perceiving activities involved with these programs and any wildlife attracted. The information provided by these individuals should help wildlife biologists provide more effective assistance to individuals encouraging residential wildlife and assess how to encourage others to become involved in these activities.

Participants in the National Wildlife Federations' backyard wildlife program were selected as an "involved" study population. The term "backyard" referred to the area surrounding a residence and may vary from a 3 acre lot to a window box planter. The NWF's backyard wildlife program

is a certification program in which applicants are required to provide a detailed application requesting information on habitat available at their residence, methods used to attract wildlife, and wildlife species observed. The applicant received certification if the residence was judged to provide wildlife with basic habitat essentials and if the application was adequately completed (C. Tufts pers. comm.). Since the effort required to complete the application was substantial, we assumed that certified individuals were interested and actively involved in residential wildlife attraction.

METHODS

A nationwide survey was conducted to evaluate respondents' perceptions of residential wildlife. A list of participants in the National Wildlife Federations' backyard wildlife program was obtained through the National Wildlife Federation. A six-page questionnaire (Appendix C) was developed and sent to the 1347 individuals on the list in October of 1979. The questionnaire consisted primarily of structured questions, but space was available for additional comments. An introductory letter and postage-paid return envelope was included with the questionnaire. The Statistical Analysis System's computer packages (Barr et al. 1979) were used to compute the frequency of all responses and to compute chi-square values for selected data. The z-test for proportion was also used to analyze selected data.

RESULTS AND DISCUSSION

Response

Eight hundred and sixty-two questionnaires were completed and

returned for a usable response rate of 64 percent. The typical survey respondent was highly educated (66 percent had completed some college or professional school), older (24 percent were retired), lived in self-owned home (98 percent), and was highly motivated regarding residential wildlife (57 percent spent over 100 dollars). The average size of the respondents' backyards was 3.5 acres (1.44 ha), with a range of 0.02 to 125 acres (0.008 to 50.59 ha). The backyard wildlife program limited the certified backyard area to 3 acres, but encouraged those with more land to extend habitat development. These backyard habitats were located both inside (47 percent) and outside (53 percent) city limits. Three characteristics of respondents were compared (Table 1) to those of the general public as found in the 1970 census results (U.S. Bureau of the Census, 1972) (1980 census results not available at this time).

Benefits

Respondents were asked to identify benefits they received from attracting wildlife to their residence. Respondents indicated that enjoyment (99 percent), beauty of wildlife attracted (92 percent) and helping wildlife survive the winter (91 percent) were the main benefits. Eighty-six percent of the respondents cited the educational value for children of a setting made more natural by the presence of wildlife. Encouraging others to become involved in residential wildlife programs might also be considered a benefit of wildlife attraction which 74 percent of the respondents engaged in. It appeared that respondents encouraged wildlife because they obtained pleasure from doing so plus they felt they were helping wildlife. Educational values and involving others enabled respondents to share benefits and concerns for wildlife with others.

TABLE 1. THREE MAJOR CHARACTERISTICS OF SURVEY RESPONDENTS COMPARED TO 1970 CENSUS RESULTS.

CHARACTERISTIC	N ^a	SURVEY RESPONDENTS PERCENTAGE	CENSUS RESULTS PERCENTAGE	Z TEST FOR PROPORTION
Self-Owned Home	842	98	59	23.0 ^b
Retired	841	24	16	6.3 ^b
College or Professional Education	826	66	22	30.5 ^b

^a N refers to the total number of responses to the question.

^b Significant at the 0.01 level.

Perceived Wildlife Response

We examined respondent's perceptions of how wildlife was responding to residential attraction attempts. Respondents were asked which type of wildlife they encourage at their residences. Not surprisingly, the two most popular groups were birds (100 percent) and mammals (80 percent). Amphibians were encourage by 63 percent of the respondents and reptiles by 49 percent.

Respondents were asked to indicate changes in the variety of wildlife groups observed since they began encouraging wildlife at their resident (Table 2). Similar results were seen when respondents were asked to indicate their perceptions of changes in total numbers of wildlife observed. The results confirmed that an accurate estimate of changes in both variety and total numbers of wildlife required the ability to recognize species and record observations systematically. Large percentages of respondents indicated that there was no change or they were uncertain of any change in amphibians and reptiles. These results were a measure of respondents' perceptions of population changes and probably do not reflect real population shifts.

Perceived Success

Respondents were asked to rate how successful they were at attracting wildlife. Forty-five percent stated they were highly successful at attracting wildlife, 54 percent stated they were fairly successful, and only 1 percent stated they were unsuccessful. These results are not surprising in view of the inherent biases. Chi-square analysis was conducted to determine what factors, if any, were affecting respondent's perceptions of their success. The more successful an individual per-

TABLE 2. RESPONDENTS' PERCEPTIONS OF CHANGES IN THE VARIETY OF WILDLIFE OBSERVED AT THEIR RESIDENCE SINCE INITIATION OF ATTRACTION EFFORTS.

WILDLIFE GROUP	INCREASE % (NO.)	DECREASE % (NO.)	NO CHANGE/UNCERTAIN % (NO.)
Winter Birds	80 (680)	5 (40)	15 (130)
Summer Birds	70 (593)	4 (39)	26 (217)
Mammals	44 (373)	11 (92)	45 (385)
Amphibians	26 (221)	8 (71)	66 (558)
Reptiles	18 (153)	12 (98)	70 (599)

ceived him or herself to be at wildlife attraction, the more likely they were to:

- (1) encourage mammals ($P = 0.0184$), reptiles ($P = 0.0030$), and amphibians ($P = 0.0003$),
- (2) use more bird houses ($P = 0.0002$),
- (3) spend more money attracting wildlife ($P = 0.0001$),
- (4) encourage the involvement of others in residential wildlife attraction ($P = 0.0001$),
- (5) consider education ($P = 0.0001$), increasing property value ($P = 0.0028$) and helping wildlife survive the winter ($P = 0.0001$) to be benefits of wildlife attraction.

Problems

We examined the types of problems associated with residential wildlife attraction. The problem cited most often by respondents was dogs and cats scaring wildlife (61 percent). Thirty-eight percent of the respondents said that attracting undesirable wildlife species was a problem and 28 percent said adjacent landuse disturbance was creating a problem. Respondents were then asked what problems they attributed to residential wildlife. Twenty-four percent of the respondents indicated that residential wildlife attracted dogs and cats, 22 percent said that wildlife damaged gardens, lawns or shrubbery, and 20 percent said wildlife was "dirty", referring to droppings and seed hulls. Wildlife species blamed most often for these problems were Starlings (*Sturnus vulgaris*, 30 percent), house sparrows (*Passer domesticus*, 24 percent), moles (*Talpidae*, 23 percent), and squirrels (*Sciuridae*, 22 percent).

Most respondents did not appear to take these problems too seriously since they did not stop encouraging wildlife. It appeared that the benefits of residential wildlife outweighed any difficulties experienced.

We examined perceptions of pet predation on residential wildlife which seemed to be a concern to many respondents. Cat predation was of primary interest, but dogs and wildlife predators were also considered. Seventy-seven percent of the respondents had observed cats frightening wildlife at their residence, but only 26 percent said that cats were keeping wildlife away. Cats were directly observed preying on wildlife by 48 percent of the respondents and indirectly observed by 57 percent. Cats were most frequently observed preying upon birds (90 percent) and mammals (44 percent). Seventy-three percent of the respondents had attempted to solve cat problems by live-trapping, shooting, use of noisemakers, or arrangement of feeders and cover vegetation. Attempts were rated highly successful by 18 percent of the respondents, fairly successful by 54 percent, and unsuccessful by 28 percent. Animals other than cats were directly observed preying on wildlife by 28 percent of the respondents. Indirect observations were made by 16 percent of the respondents. Non-feline predators observed most often were hawks (Accipitridae, 24 percent), dogs (Canidae, 16 percent), owls (Strigiformes, 8 percent), and snakes (Serpentes, 6 percent). Predation by cats was observed more frequently than predation by either dogs or wildlife predators. It appeared that cats were the most obvious predator on residential wildlife in urban areas. More research is needed on the role of cats as predators on residential wildlife.

Several problems experienced by individuals encouraging residential

wildlife were caused by people. Complaints from neighbors or city officials who would prefer a well-manicured yard to backyard wildlife habitat can create many problems. Respondents were asked if complaints from city officials or neighbors were a problem. Twelve percent of the respondents had received complaints from neighbors, while 3 percent had received complaints from city officials. These complaints do not appear to be widespread, but they can be serious when city mowing and weed control ordinances are involved. It appeared that in most cases if neighbors or officials knew the reason behind the "unkempt" yard, there were not as many complaints. Other "people originated" problems experienced by respondents were adjacent landuse disturbance (28 percent), children frightening wildlife (14 percent) and vandalism to feeders, birdhouses, or nest boxes (5 percent).

Desired Assistance

Many respondents commented on the kinds of assistance that would be helpful to them in attracting wildlife. Respondents stated that they needed assistance in: solving conflicts between cats and wildlife (29 percent), controlling wildlife pests (1 percent), meeting expenses of wildlife attraction (1 percent), and acquiring information on attracting particular wildlife species (1 percent).

Lack of information did not appear to be a serious problem for respondents since only 5 percent said that a lack of information made wildlife attraction difficult. However, providing information on specific wildlife topics to interested persons would probably help them be more successful at attracting wildlife and gain more satisfaction from these activities.

CONCLUSIONS

Respondents attracted wildlife to their residences because they found the presence of wildlife personally beneficial and because they derived feelings of satisfaction from helping wildlife. Birds and mammals were the preferred wildlife groups in residential areas. The major problems respondents faced in attracting wildlife to their homes were dogs and cats scaring wildlife, undesirable wildlife species keeping more desirable species away, and the deleterious effects of adjacent landuse disturbance. The problems residential wildlife were most often blamed for included attracting dogs and cats, damaging lawns and gardens, and sanitation problems. Many respondents were concerned with wildlife becoming an easy target for predators, particularly cats, in residential areas. Needs expressed by individuals involved in encouraging residential wildlife were assistance in solving conflicts between cats and wildlife, avoiding wildlife pests, and meeting the expenses of wildlife attraction. Information on attracting particular wildlife species was desired by some respondents.

Natural resource managers can assist individuals participating in residential wildlife attraction through education. Results of this study suggest that providing interested individuals with more exposure to basic ecological principles, perhaps relating them to attraction activities, would be helpful. Satisfaction with wildlife attraction activities could be increased by providing individuals with information on wildlife identification and on keeping records of species observed. Specific information on amphibians and reptiles might help individuals become more receptive to them. Pet owners should be made aware of the problems caused by roaming pets. Enactment and enforcement of leash

laws, for both dogs and cats is a widespread need. Participants in backyard wildlife programs need help in giving preferred wildlife an advantage over cats and other vertebrates. Practical information on removal and avoidance of undesirable wildlife species should be made available to wildlife attractors. Participants in backyard wildlife programs would also be helped by information on attracting particular wildlife species.

Survey participants were selected because they were known to be involved in residential wildlife attraction. This made them an atypical group in comparison to the general public. Comparison to 1970 census results showed that survey respondents were older, more highly educated, and more lived in self-owned homes than did the general public.

To increase the extent of participation in wildlife attraction activities, efforts should be aimed at involving the general public, particularly those who are not college educated and who live in rented housing. Efforts should focus on an introduction to wildlife ecology related to residential wildlife attraction. Information on cutting the costs of wildlife attraction should be made available in order to maintain participation.

Future prospects for residential wildlife are uncertain. As the age structure of our population shifts upward, participation in residential wildlife attraction may increase. However, this increase may be countered by an increase in the portion of the population living in rented housing. This may make the home-owning wildlife attractor more atypical, and may point to the development of neighborhood wildlife parks to supplement residential wildlife attraction.

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CHAPTER III

PREDATION ON RESIDENTIAL WILDLIFE

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Abstract: A questionnaire survey was used to examine perceptions of predation on residential wildlife. Cat predation was the primary concern, but other predators were also considered. The 1347 questionnaires were sent to individuals known to be involved in wildlife attraction activities. Respondents were aware of conflicts between cats and wildlife in residential areas, but did not appear to perceive these conflicts as serious. Respondents observed that birds were the most common prey taken by cats. The need for more research on cat - wildlife conflicts in residential areas was pointed out.

Development of wildlife habitat in residential areas is gaining in popularity. Wildlife may experience a direct benefit when "new" habitat is created in urban areas and indirect benefits when the urban dweller becomes more aware of wildlife and natural systems. It is possible, however, that attracting wildlife to urban areas may be creating problems for wildlife. An area of concern to many is the effect of predation by free-roaming and feral cats on wildlife in urban areas.

A great deal of controversy surrounds the question of cat predation

on wildlife. Many cat enthusiasts believe that cats pose no threat to wildlife populations and should be allowed to roam free. Others, not so fond of cats, believe that any roaming cat is a threat to wildlife and should be destroyed. The National League of Cities conducted a survey of city officials, which elicited their constituents' most frequent complaints. The study showed that citizens most often complain to mayors about dogs and other pet control problems (Bancroft 1974). Howard (1974) pointed out the problem with predation on urban wildlife by stating that the greatest predator problems are due to the ever-present subsidized predators, dogs and especially cats, because to hunt and kill is their life.

Many studies have examined the role of domestic cats as wildlife predators. These studies have looked at food habits of feral or field roaming cats and roaming cats from residential areas, considered to be pets. Stomach contents were analyzed in most of these studies although some studies involved keeping a record of prey brought into homes by pet cats. These studies found that in residential areas the primary food of roaming cats was table scraps and garbage (McMurry and Sperry 1941, Eberhard 1954). The primary food of feral cats was found to be rodents (Errington 1936, Hubbs 1951, Eberhard 1954, McMurry and Sperry 1951). These studies showed that birds were a minor item in the feral cat's diet. Hubbs (1941) suggested, however, that cat predation on breeding pheasants and ducks may have been serious in the Sacramento Valley.

Studies of cat predation on wildlife showed that cats are opportunist feeders. They will adjust levels of predation on a species according to availability. Coman and Brunner (1972) examined food habits of feral house cats in Victoria, Australia. They found that predation was

heavier on indigenous mammals than introduced mammals in areas where the fauna was not directly affected by human activity. In areas where human activity could be expected to alter the faunal populations, only introduced mammals were taken by cats.

All of these studies must be examined in the light of the effects of predation on the prey population. Errington (1936) pointed out that preying on a species is not necessarily synonymous with controlling it, or even influencing its numbers to any perceptible degree. Coman and Brunner (1972) felt that losses due to cat predation on low density, small native mammal populations might be significant in reducing the population, but cat predation on high density, introduced rabbit and mouse populations might only be reducing a surplus.

Studies of cat predation on wildlife have been conducted primarily in rural, open areas. Most of these studies were completed over 30 years ago. With increasing interest in attracting wildlife to urban and residential habitat, availability of wildlife prey in residential areas may have changed. The purpose of our study was to examine the current status of cat predation on wildlife in residential areas. We attempted to do this by questioning individuals involved in attracting wildlife to their residence about their perceptions of cat-wildlife conflicts. This included questions on whether cats were frightening wildlife or preying on wildlife, how heavy any losses were, identification of the prey species, and approaches to solving these problems.

We thank Dr. William Warde for assistance with statistical analysis. We also thank Craig Tufts of the National Wildlife Federation for help with planning this survey. Funding for the study was provided by the National Wildlife Federation's Conservation Fellowship Program

and the Oklahoma Cooperative Wildlife Research Unit.

METHODS

A nationwide questionnaire survey concerned with participation in residential wildlife enhancement activities was developed. A portion of the survey dealt with cat-wildlife conflicts. The survey was mailed to the 1347 known participants in the National Wildlife Federation's (NWF) backyard wildlife program in October of 1979. The questions were structured, but space was available for comments. Letters explaining the project and postage-paid return envelopes were included with the questionnaires. The Statistical Analysis System's computer packages (Barr et al. 1979) were used to compute frequencies for all responses.

STUDY POPULATION

The NWF's backyard wildlife program is a certification program in which applicants are required to provide a detailed application requesting information on habitat available at their residence, methods used to attract wildlife, and the wildlife species observed. The applicant received certification if the residence was judged to provide wildlife with basic habitat essentials and if the application was adequately completed (C. Tufts pers. comm.). Since the effort required to complete the application was substantial, we assumed that certified individuals were interested and actively involved in residential wildlife attraction.

RESULTS AND DISCUSSION

The NWF survey resulted in 862 completed useable questionnaires, for a response rate of 64%. The typical survey respondent was highly educated (66% had completed some college or professional school), older (24%

were retired), and lived in a self-owned home (98%). The average size of the respondents' backyard was 3.5 acres (1.44 ha). The backyard wildlife program limited the certified backyard area to 3 acres, but encouraged those with more land to extend habitat development. These backyard habitats were located both inside (47%) and outside (53%) city limits.

Respondents appeared to detect a conflict between wildlife and domestic pets. Examination of factors which made it difficult to attract wildlife to residential areas revealed that 61% of the respondents said dogs and cats were scaring wildlife. Twenty four percent of the respondents said that wildlife in residential areas attracted dogs and cats.

Respondents' perceptions of the conflicts between cats and wildlife were examined in some detail. Seventy seven percent of the respondents stated that cats were frightening wildlife at their residence, but the number of respondents who felt that cats were keeping wildlife away from their residence was considerably less (Fig. 1). Respondents had directly and indirectly observed cats preying on wildlife at their residences (Fig. 2). Direct observations of cats preying on wildlife had been made on an average of 4.6 times in 1 year and indirect observations, such as finding prey remains, were made on an average of 5.8 times. Types of wildlife reported as being preyed upon by cats most frequently were birds and mammals (Fig. 3). While interpreting these results, it must be remembered that respondents were reporting on their observations of predation only. This does not take into full account predation on nocturnal species or predation occurring in areas with low visibility.

The responses given to the questions on cat predation indicated

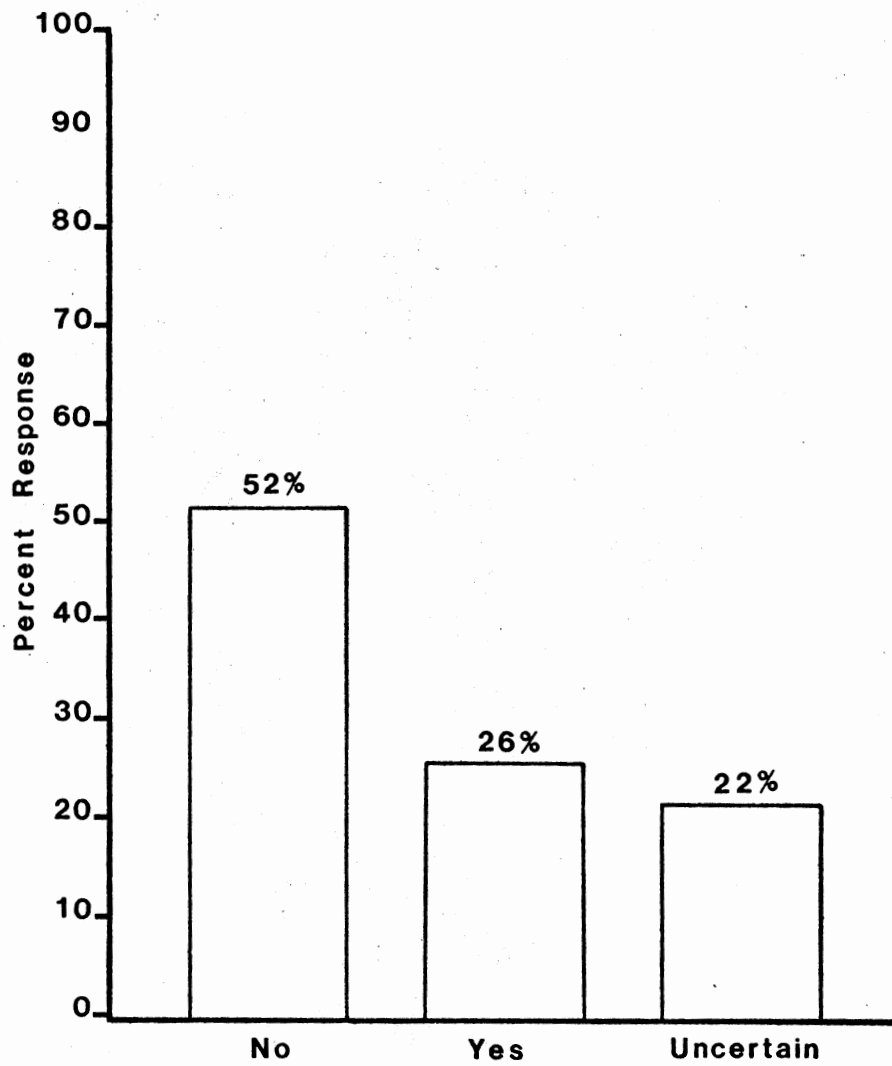


Fig. 1. Response of survey respondents to the question:
Are cats keeping wildlife away from your residence?

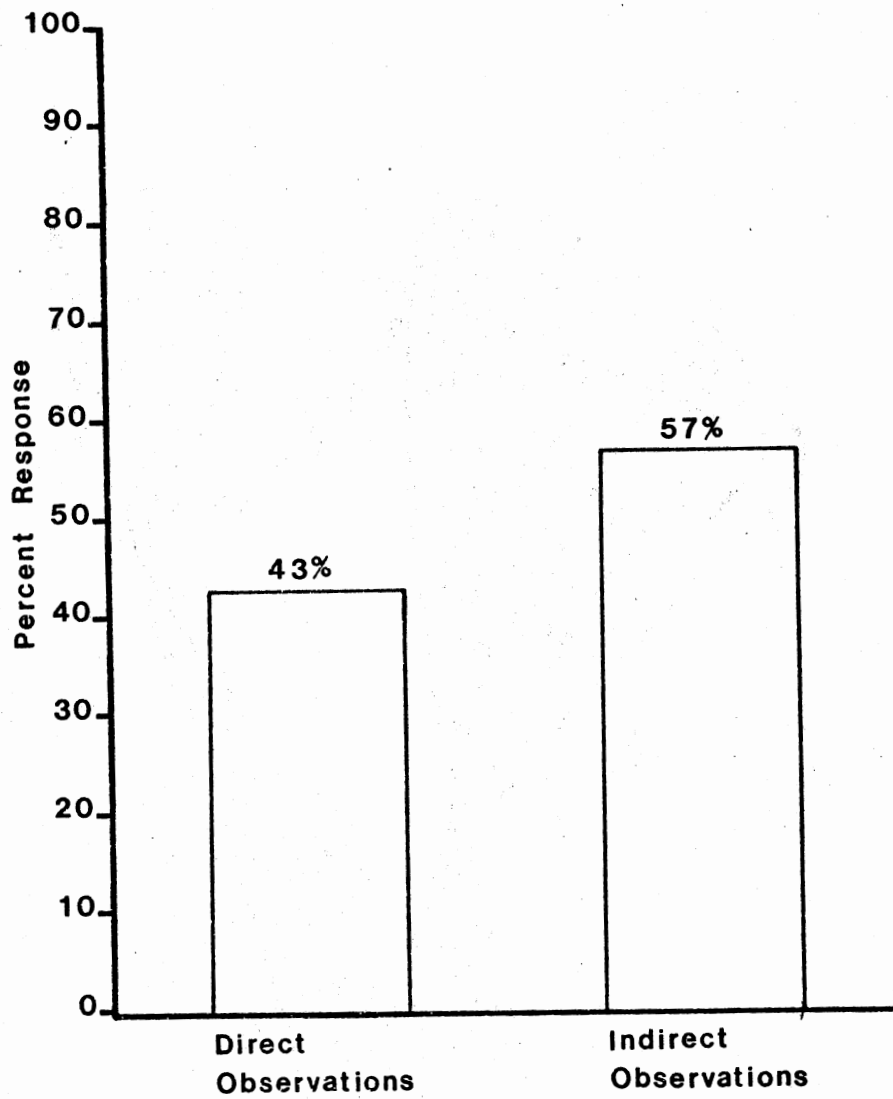


Fig. 2. Percentage of survey respondents observing cat predation on residential wildlife.

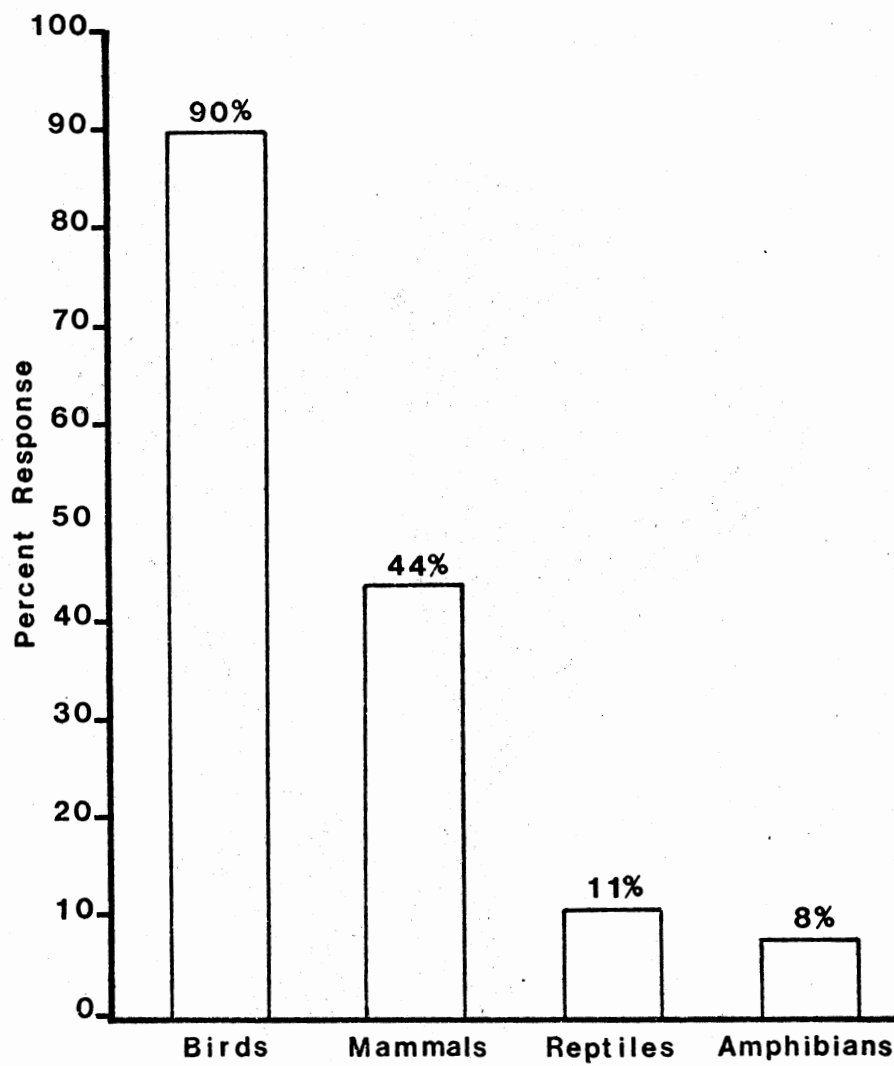


Fig. 3. Percentage of survey respondents observing the different types of prey taken by cats in residential habitat.

that respondents were aware of a conflict between cats and wildlife. The low percentage of respondents who stated that cats were keeping wildlife away from their residence would indicate that most respondents did not feel the problem was serious for wildlife or themselves. Seventy three percent of the respondents had attempted to solve cat-wildlife problems at their residence and most (72%) stated they were successful at these attempts. Methods used by respondents to solve cat-wildlife problems included enactment of leash laws, placing bells on cats, arrangement of feeders and cover vegetation, use of noise-makers, live-trapping, and shooting.

The comments of respondents in regards to the cat-wildlife conflict revealed much about attitudes towards cats, both favorable and unfavorable. In defense of cats, respondents stated that they felt cats were getting an undeserved bad name, cats were needed to control undesirable rodents, cats were not harming wildlife, and that cats killing wildlife was no worse than people hunting. Other respondents pointed out the serious nature of the feral cat and dog problem and the need to stress to people the damage that roaming pets can cause. They stated that house cats are not part of the natural ecosystem and should be confined, particularly during the nesting season. Additional comments were made both for and against cats, but all pointed out the conflict in attitudes towards cat predation on wildlife that exists.

Respondents had observed animals other than cats preying on wildlife at their residence. The percentage of respondents making these observations was not high (Fig. 4). Animals other than cats which were cited most often for preying on wildlife were hawks (Accipitridae, 25%) and dogs (Canidae, 16%). It appeared that in residential areas, cats

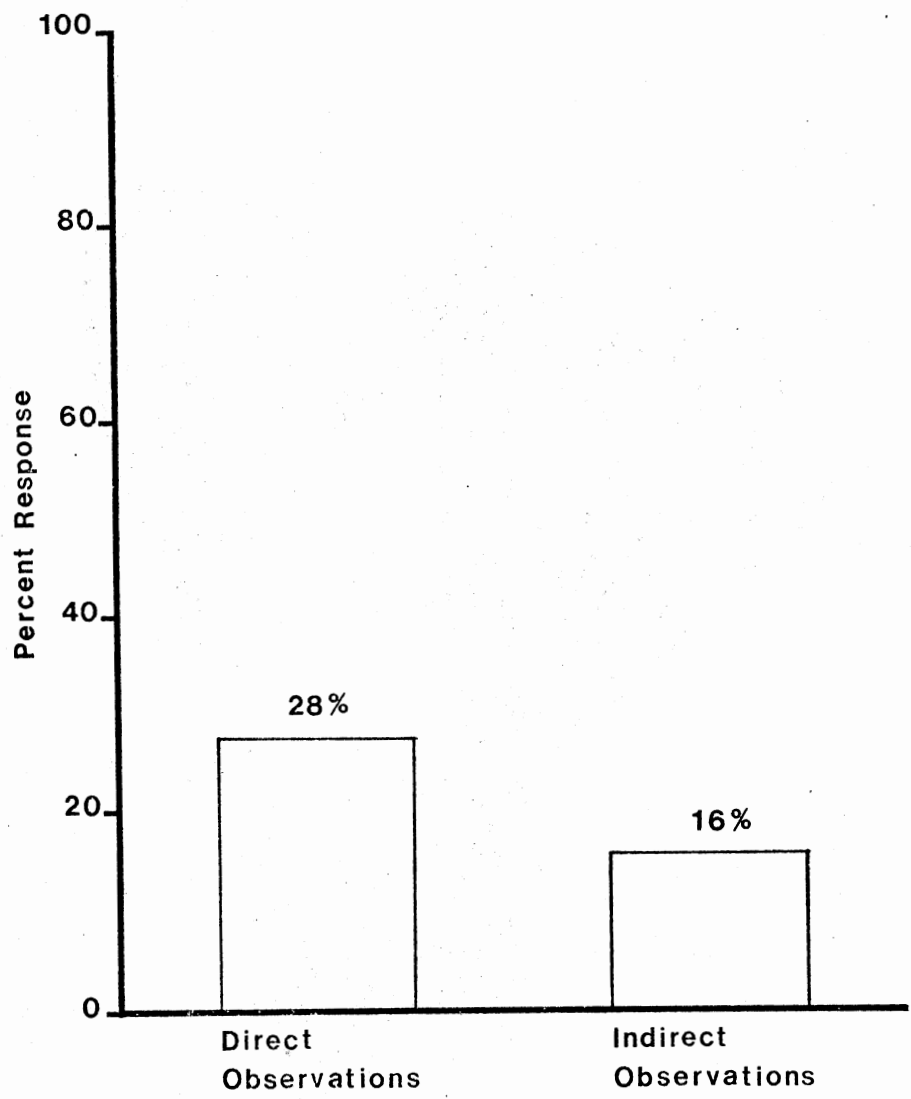


Fig. 4. Percentage of survey respondents observing non-feline predation on residential wildlife.

were the most obvious predator on wildlife.

CONCLUSIONS

Respondents appeared aware of conflicts between cats and wildlife in residential habitat, due to cats both frightening wildlife and preying on wildlife. Since most respondents said that they had been successful at solving these cat-wildlife conflicts, it appeared the conflicts were not perceived to be very significant. Predation by animals other than cats appeared to be of a lesser magnitude in residential areas.

A problem does exist between cats and wildlife in residential areas. The significance of this problem for wildlife populations is presently uncertain. This pointed out the need for more research on cat-wildlife conflicts in residential areas. Not only do we need to find out the kinds and numbers of prey taken by cats, but we also need information on the effects of predation on prey populations. Future studies should combine observations of cat predation with stomach or scat analyses. The use of radio-telemetry equipment with cats might be helpful. These studies would be most valuable when conducted in urban areas where information on population dynamics of various prey species of cats, such as birds and small mammals, is available. Conducting studies of cat-wildlife conflicts would require careful consideration of public attitudes towards cats.

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CHAPTER IV

WILDLIFE ENHANCEMENT ACTIVITIES IN STILLWATER, OKLAHOMA

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Abstract: Two questionnaire surveys were conducted to examine wildlife enhancement activities in Stillwater, Oklahoma. An extensive mail survey results in 234 returned questionnaires and 36 personal interviews were conducted. Participants showed a great deal of interest in residential wildlife. Primary interest was encouraging birds through supplemental feeding and watering. The major problems incurred by respondents participating in residential wildlife attraction involved wildlife depredation of gardens and conflicts between wildlife and cats. These problems appeared to be outweighed by the benefits of wildlife at residences, ie. beauty, enjoyment, and education value. Results of the survey pointed out a need for an educational program dealing with residential wildlife in Stillwater.

Urbanization is increasing. This increase is accompanied by a loss of wildlife habitat and a loss of contact between the urban dweller and natural systems. One way in which these losses can be compensated is by developing wildlife habitat in urban areas. Residential or backyard habitat is one type of urban wildlife habitat. Residential habitat can

maximize contact between wildlife and man, but it may also create conflicts. Current attempts to attract wildlife to residential habitat should be examined in order to help assure a peaceful coexistence between wildlife and man. The purpose of this study was to examine involvement of Stillwater, Oklahoma residents in wildlife enhancement activities.

We thank Dr. William Warde for his assistance with statistical analysis. Funding for this study was provided by the National Wildlife Federation's Conservation Fellowship Program and the Oklahoma Cooperative Wildlife Research Unit.

METHODS

Two questionnaire surveys were used to sample the residents of the Stillwater, Oklahoma area. A random sample of 1000 individuals, residents of the Stillwater area, was selected to participate in a mail survey. The sample was drawn from the Stillwater telephone directory. Randomization of the sample was insured by using a computer program that selected random numbers corresponding to page, column, and row numbers in the telephone listing.

The questionnaire used in the mail survey (Appendix A) was designed to determine the number of individuals currently involved in wildlife enhancement activities as well as potential participants. Participants were questioned about methods used to attract wildlife to their residences. The questionnaire was printed as a brochure, which included an introductory cover letter and pre-paid return envelope. The questionnaires were mailed in May of 1979. The questionnaires were mailed third class, but 200 were stamped "return requested" so that an estimate of undeliverable questionnaires could be obtained. A follow-up question-

naire was mailed to non-respondents 3 weeks after the original mailing. One hundred non-respondents were randomly selected after the second mailing and attempts were made to contact them for telephone interviews in order to obtain an estimate of non-response bias.

Mail survey respondents were asked if they would be willing to participate in a more in-depth survey. Volunteers from the mail survey, who were involved in attracting wildlife to their residence were selected for participation in personal interviews. Thirty six individuals were interviewed. The 6 page questionnaire used in this survey (Appendix B) was designed to gain information on methods used to attract wildlife, attitudes towards residential wildlife, problems associated with residential wildlife, and perceptions of success at wildlife attraction. The questionnaire consisted of structured questions, but space was available for additional comments.

STUDY AREA

Stillwater is a university community located in north-central Oklahoma. The vegetation type of the Stillwater area includes the tall grass prairie and post oak-blackjack described by Duck and Fletcher (1943). The Stillwater area is within the oak and bluestem parkland (Bailey 1976). A variety of wildlife species are found in the area. Grula (1971) observed 198 species of birds on Stillwater's Boomer Lake and adjacent areas. Eighteen species of mammals were found in the Stillwater Creek Greenbelt (Barclay et al. 1973). Reptiles and amphibians occurring in the Stillwater area have been reported by Moore and Rigney (1942) and Webb (1970).

Stillwater's estimated 1980 human population was 38,500. Population characteristics in Stillwater have been influenced by the presence

of Oklahoma State University. Stillwater's population is young and Stillwater residents are highly educated (Board of Commissioners, Stillwater, Oklahoma 1978).

RESULTS AND DISCUSSION

Response

The response to the mail survey is shown in Table 1. The total number of useable returned questionnaires was 234. Follow-up surveys were responsible for nearly half of the responses. The useable response rate was 34.2%, following adjustments for the estimated number of undeliverable questionnaires. The validity of a questionnaire survey is dependent on how well the sample population represents the study population. Mail survey responses were examined on the basis of original mailing and follow-ups in order to gain an estimate of non-response bias.

Thirty six personal interviews were completed. Characteristics of interviewed participants were compared to characteristics of the total Stillwater population (Table 2). Participants were older, and represented more professional and technical careers than the total Stillwater population. A higher percentage of participants owned their homes than did Stillwater residents as a whole. The differences were significant at the 0.01 level. Probable causes for these differences between Stillwater residents and survey respondents were non-response bias and actual differences between the 2 groups. The higher percentage of older individuals among survey respondents might be related to the ease of finding these individuals at home. The high representation of professional and technical careers among survey participants is likely a characteristic of individuals involved in residential wildlife enhance-

Table 1. Response to residential wildlife mail survey.

Questionnaires	Initial mail survey		Follow-up mailing	Telephone	Sample total
	Returnable	Non-returnable			
No. contracts	200	800	850	98	1000
No. completed-useable	119		79	36	234
No. returned-undeliverable	63	252 ^a	268		315 ^a
No. sent minus No. undeliverable	137	548	582		685
Percent response ^b	17.4		13.6		34.2

^a Value estimated from returnable questionnaires

^b Percent response = (no. completed useable) / (no. sent - no. underliverable)

Table 2. Comparison of characteristics of interview participants to the Stillwater population.

Characteristics	Interview Participants % (N = 36)	Stillwater Population % (N = 38,500)	Z Test for Proportion
Home ownership			
Own	94	45	5.91 ^c
Rent	6	55	- 7.97 ^c
Education level			
Elementary-junior high school	6	14	- 1.38
Senior high school	22	30	- 1.93
University	72	56	-
Occupation level			
Professional-technical	53	23 ^b	4.28 ^c
Managers-officials-proprietors	-	8	-
Craftsman-foreman	10	11	0.19
Sales-clerical	10	24	- 1.97 ^d
Operatives	7	13	1.07

Table 2. Continued.

Characteristics	Interview Participants % (N = 36)	Stillwater Population % (N = 38,500)	Z Test for Proportion
Farm workers	7	5	0.55
Service	7	16	- 1.47
Student	7	-	-
Retired	31	7	5.64 ^c

^a Board of Commissioners Stillwater, Oklahoma 1978.

^b The occupation levels for the Stillwater population are figures for Payne County.

^c Significant at the 0.01 level.

^c Significant at the 0.05 level.

ment activities. In a study of american attitudes toward animals, Kellert (1976) found education to be one of the most consistent social differentiators of people's views towards animals. College educated people tended to be more naturalistic and ecological in their orientation. Questions relating to general information and characteristics of interview participants resulted in additional information. Seventeen percent of the participants had either 1 or 2 children living with them. Twenty three percent had adjacent neighbors with children. Fifty percent of the participants had dogs and 22% had cats. Participants owned an average 2 dogs and 2 cats. The most frequently reported occupation of participants was teaching or school administration (43%). Thirty one percent of the respondents were retired.

Participation

Mail survey results indicated that a high percentage of the respondents (66%) were involved in encouraging wildlife at their residence (Table 3). The percentage of respondents involved in attracting wildlife was considerably lower in the telephone follow-ups than in the first and second mailings. This indicated that non-response bias may be leading to an over-estimation of participation in wildlife enhancement activities in Stillwater.

Individuals not presently involved in attracting wildlife were questioned in regards to potential involvement in these activities (Table 4). Seventy eight percent of these individuals indicated that they enjoy wildlife at their residence. Forty percent of these respondents indicated a possibility for future involvement in wildlife enhancement activities. The response to these questions involving

Table 3. Involvement of mail survey respondents in wildlife enhancement activities.

Response	First mailing		Second mailing		Telephone		Total	
	%	(No.)	%	(No.)	%	(No.)	%	(No.)
Participant	67	(80)	70	(55)	53	(19)	66	(154)
Non-participant	33	(39)	30	(24)	47	(17)	34	(80)

Table 4. Potential involvement in wildlife enhancement activities of mail survey respondents not presently involved in these activities.

Response	First mailing		Second mailing		Telephone		Total	
	%	(No.)	%	(No.)	%	(No.)	%	(No.)
Enjoy wildlife	85	(33)	58	(14)	94	(15)	78	(62)
Do not enjoy	5	(2)	0		6	(1)	4	(3)
Indifferent	10	(4)	42	(10)	0		18	(14)
Possible future involvement								
Yes	39	(13)	39	(9)	41	(7)	40	(29)
No	30	(10)	26	(6)	41	(7)	31	(23)
Unsure	30	(10)	35	(8)	18	(3)	29	(21)

persons not currently involved in wildlife attraction indicated a potential for expanded involvement of Stillwater residents in these activities.

Respondents who encourage wildlife were asked how long they had been involved in these activities at their current address (Table 5). The majority of the respondents had been encouraging wildlife for 5 years or less, which may be indicative of the highly transitory population in a university town. Interview participants had been encouraging wildlife for a period of 1 to 39 years. The mean length of time these participants had been encouraging wildlife was 13 years.

Respondent preference for various wildlife groups should be related to the types of wildlife being encouraged (Table 6). Birds appeared to be the most popular type of residential wildlife, followed by mammals, in both surveys. Examination of mail survey results for non-response bias indicated that a higher frequency of individuals encouraging wildlife other than birds responded to the first mailing than responded to the follow-ups.

Attraction Methods

Methods used to encourage wildlife were examined in both surveys (Table 7). The most common method used to attract wildlife in each survey was supplemental feeding. Ninety percent of the mail survey respondents who were attracting wildlife, were providing food. The percentage of all mail survey respondents feeding wildlife was determined to be 59%. As indicated in Table 8, the results of the Stillwater survey were near the median of a wide range of percentages with Cauley (1974) and Dagg (1970) obtaining a higher percentage of respondents

Table 5. Length of time Stillwater respondents have been involved in wildlife enhancement activities.

Years	Mail Survey		Interviews	
	%	(No.)	%	(No.)
0 - 5	56	(84)	38	(11)
6 - 10	14	(21)	14	(4)
11 - 15	9	(14)	7	(2)
16 - 20	9	(13)	17	(5)
21 +	12	(119)	24	(7)

Table 6. Reported emphasis on wildlife groups encouraged by Stillwater survey respondents.

Wildlife group	Mail Survey		Interviews	
	%	(No.)	%	(No.)
Birds	99	(151)	100	(34)
Mammals	37	(57)	47	(16)
Reptiles			21	(7)
Amphibians	14	(21) ^a	26	(9)

^a Reptiles and amphibians were combined in Survey I.

Table 7. Methods used by Stillwater survey respondents to attract residential wildlife.

Method	Mail Survey		Interviews	
	%	(No.)	%	(No.)
Supplemental feeding	90	(139)	97	(35)
Providing water	67	(103)	86	(31)
Planting vegetation	56	(86)	81	(29)
Providing bird houses and nest boxes	40	(61)	47	(16)
Changing yard care practices	-	-	31	(11)

Table 8. Percentage of respondents feeding urban wildlife as reported in 5 different studies, 1971-1981.

Study	Location	% Feeding
D.C. Cauley (1974)	Suburban Detroit	72
A.I. Dagg (1970)	Waterloo, Ontario	63
J.A. Yeomans (1981)	Stillwater, Oklahoma	59
Brown and Dawson (1978)	Metropolitan New York	50
Payne and DeGraff (1975)	Amherst, Massachusetts	43

feeding wildlife and Brown and Dawson (1978) and Payne and DeGraaf (1975) obtaining a smaller percentage.

Ninety seven percent of the interview participants fed wildlife. All interview participants who fed wildlife did so in the winter and many respondents also fed wildlife in the fall (Figure 1). The most common types of food given to wildlife are shown in Table 9.

Provision of water was another common method used to attract wildlife (Table 7). Water was used most frequently in the summer, but many respondents provided water year round (Figure 2). Bird baths, unheated (84%) and heated (72%), were used most often to provide water, followed by making use of pans or other containers filled with water (50%).

Interview participants also relied upon yard care practices to attract wildlife. Eighty six percent of the respondents planted various types of vegetation for wildlife. A breakdown of the vegetation types planted can be seen in Table 10. Wildlife attraction, however, seemed to be more of a positive side effect of landscaping by participants, rather than an actual consideration in the planning stage. Changes in yard care practices for wildlife were undertaken by 31% of the participants. These yard care changes included limited or no pesticide use (53%), less pruning (53%), and allowing flowers and weeds to go to seed (53%). A difficulty with the use of yard care practices to examine participation in wildlife attraction activities occurs when participants do not need to plant additional vegetation or have been using various yard care practices all along, so that changes in methods do not apply.

The last method of wildlife attraction discussed was providing bird houses and nest structures for wildlife. Forty percent of the mail survey respondents provided bird houses or nest boxes and 47% of the

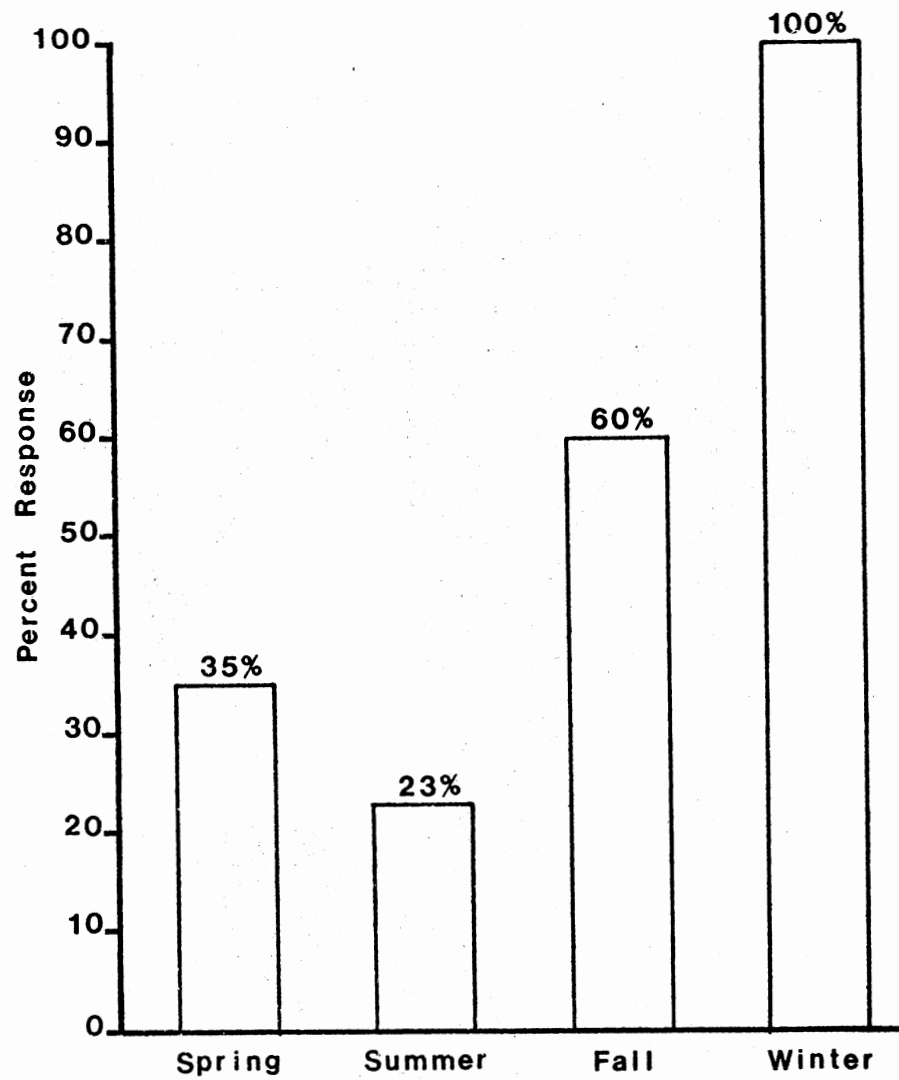


Fig. 1. Seasonal feeding of residential wildlife by interview participants.

Table 9. Supplemental foods provided for residential wildlife by interview participants.

Food type	Response	
	%	(No.)
Wild bird seed	57	(20)
Table scraps	37	(13)
Suet or fat	29	(10)
Nutmeats	23	(8)
Hummingbird nectar	23	(8)
Wheat	20	(7)
Scratch feed	20	(7)
Bakery products	17	(6)
Fruits	11	(4)
Corn	11	(4)
Milo	6	(2)
Other	14	(5)

Table 10. Vegetation types planted for residential wildlife habitat by interview participants.

Vegetation type	Response	
	%	(No.)
Trees		
Coniferous	56	(20)
Deciduous	53	(19)
Shrubs		
Coniferous	47	(17)
Deciduous	39	(14)
Herbaceous plants	64	(23)

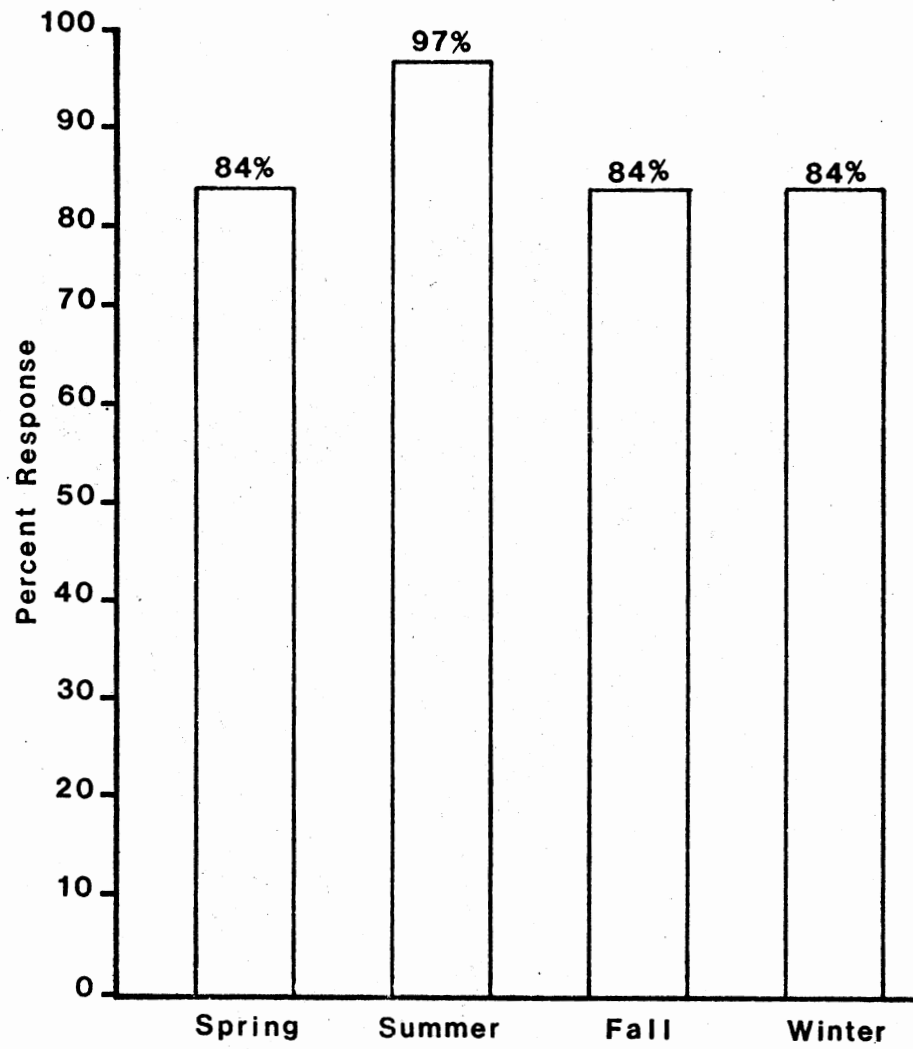


Fig. 2. Seasonal provision of water for residential wildlife by interview participants.

interview participants provided birds with an average of 2 bird houses per respondent. Ninety percent of these bird houses were reported active.

Interview participants were asked how much money they spent encouraging wildlife during a years time. Seventy three percent reported spending \$50 or less, encouraging wildlife, while 23% of the participants spent between \$51 and \$100. A more complete breakdown of expenditures can be seen in Table 11.

Wildlife Response

Respondents from both surveys were asked if they had detected any changes in the wildlife observed at their residences since undertaking wildlife attraction activities. Fifty three percent of the mail survey respondents noted an increase in variety of wildlife observed, 3% noted a decrease, and 44% said either they were uncertain of any changes or there was no change. Interview participants were asked to indicate changes in both variety and total numbers of the various wildlife groups observed at their residences (Tables 12, 13). The largest increases in both variety and total numbers were observed in winter birds, with summer birds second. This would be expected since most attraction attempts were aimed at birds. Many respondents appeared to have difficulty detecting changes in the different wildlife groups, particularly amphibians and reptiles. These results confirmed that any observation of change in wildlife is limited by the ability to recognize the species present and to keep accurate records of species observed. These results represent participants perceptions of changes in wildlife observed and probably do not reflect real population shifts.

Table 11. Annual expenditures reported by interview participants for attracting residential wildlife.

Dollars spent	Response	
	%	(No.)
0 - 50	73	(24)
51 - 100	24	(8)
101 - 150	-	(0)
151 - 200	-	(0)
201 - 250	3	(1)

Table 12. Changes in variety of observed residential wildlife reported by interview participants.

Wildlife group	Increase		Decrease		No change		Uncertain	
	%	(No.)	%	(No.)	%	(No.)	%	(No.)
Winter birds	44	(16)	8	(3)	22	(8)	25	(9)
Summer birds	39	(14)	8	(3)	28	(10)	25	(9)
Mammals	22	(8)	8	(3)	25	(9)	44	(16)
Amphibians		(0)	14	(5)	42	(15)	44	(16)
Reptiles	3	(1)	11	(4)	42	(15)	44	(16)

Table 13. Changes in total numbers of observed residential wildlife reported by interview participants.

Wildlife group	Increase		Decrease		No change		Uncertain	
	%	(No.)	%	(No.)	%	(No.)	%	(No.)
Winter birds	50	(18)	8	(3)	19	(7)	22	(8)
Summer birds	31	(11)	5	(2)	36	(13)	28	(10)
Mammals	17	(6)	14	(5)	22	(8)	47	(17)
Amphibians	3	(1)	14	(5)	39	(14)	44	(16)
Reptiles	5	(2)	17	(6)	36	(13)	42	(15)

Success

Participants' perceptions of success at encouraging wildlife were examined during interviews. When asked to rate their attempts to encourage wildlife at their residences, most rated themselves highly successful (12%) or fairly successful (85%). These results are not surprising in view of inherent biases. When discussing problems encountered in wildlife attraction, 6% of the respondents said that "no success" was a problem. Evoking an interest in other people to encourage wildlife might be considered another estimate of success. Fifty percent of the participants said they had interested others in becoming involved in wildlife attraction and 12% were unsure.

Problems

Participants' perceptions of problems with attraction attempts and any wildlife attracted were examined during personal interviews (Table 14). Major concerns appeared to be dogs and cats were scaring wildlife (56%), attracting undesirable wildlife species (31%), and incompatible adjacent landuse 22%. Problems attributed to residential wildlife included sanitation problems (22%), damage to gardens or landscaping (17%), and noise problems (8%) (Table 15). Types of wildlife causing the most problems were starlings (*Sturnus vulgaris*, 67%), house sparrows (*Passer domesticus*, 25%), and moles (*Talpidae*, 19%). The problems cited most often dealt with participants' concerns about wildlife damage to personal property. However, most respondents appeared to feel that the problems caused by residential wildlife were outweighed by the benefits obtained. Participants most concerned with problems caused by residential wildlife were concerned primarily with garden losses.

Table 14. Attraction attempt problems encountered in attracting wildlife by interview participants.

Problem	Response	
	%	(No.)
Dog or cats scaring wildlife	56	(20)
Attracting undesirable wildlife	31	(11)
Adjacent landuse disturbance	22	(8)
Bees or wasps in bird houses	11	(4)
Vandalism to feeder, birdhouses, etc.	6	(2)
Children scaring wildlife	6	(2)

Table 15. Problems attributed to residential wildlife by interview participants.

Problem	Response	
	%	(No.)
Sanitation	22	(8)
Garden or landscape damage	17	(6)
Noisy	8	(3)
Attracting dogs or cats	6	(2)
Damage to house or other buildings	6	(2)

Perceptions of predation on residential wildlife were also examined during interviews. Of particular interest was the role of cat predation, but non-feline predators were also considered. Sixty four percent of the participants said cats were frightening wildlife at their residence. However, only 30% felt that cats were keeping wildlife away. Forty percent of the participants said they had directly observed cats preying on wildlife at their residence and 53% said they had observed indirect evidence of cats preying on wildlife (Figure 3). Twenty nine percent of the respondents had directly observed non-feline predation on wildlife at their residence. Non-feline predation was observed indirectly by 18% of the respondents (Figure 3). Non-feline predators observed most often were dogs (Canidae, 26%) and owls (Strigiformes, 6%). Other predators mentioned were skunks (Mustelidae), coyotes (Canis latrans), hawks (Falconiformes), blue jays (Cyanocitta cristata), and starlings. The most obvious threat to residential wildlife in the Stillwater area appears to be from domestic pets. Wildlife predators such as owls and coyotes do not appear to be a problem in this area and probably have the potential of becoming a problem only in rural and city fringe areas.

Complaints from neighbors or city officials can be a serious deterrent to development of residential wildlife habitat. However, the problem did not appear to be widespread in Stillwater. Only one participant indicated receipt of complaints from neighbors and none had received complaints from city officials.

Eight percent of the interview participants indicated that a "lack of information" was a problem. However, making information and assistance available to interested people might help them be more successful

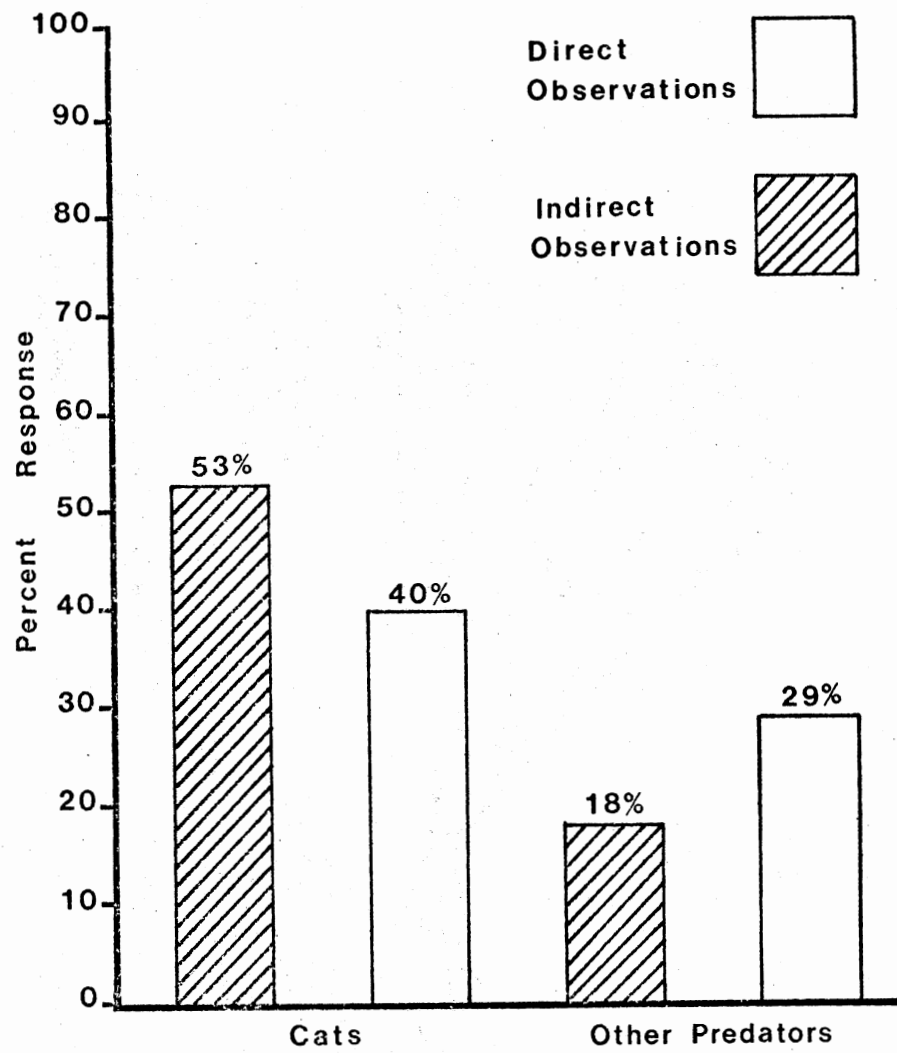


Fig. 3. Percentage of interview participants observing predation on residential wildlife by cats and other predators.

at wildlife attraction and gain more satisfaction. Participants were given a list of 10 types of information and were asked to indicate which types would be most helpful to them in dealing with wildlife at their residence. Response percentages are shown in Table 16. The information desired most frequently was preferred food of various wildlife species (70%), plants attractive to wildlife (41%), building birdhouses and nesting structures (37%), and assistance at making ones yard better wildlife habitat (37%).

Benefits

Interview participants were asked to indicate benefits they received from encouraging wildlife at their residences (Table 17). Ninety four percent of the participants cited "enjoyment" as a benefit of wildlife attraction. Other benefits cited frequently were "helping wildlife", "beauty of wildlife attracted", "insect pest control", "educational benefits for children", and "preservation of natural resources".

SUMMARY AND CONCLUSIONS

The Stillwater mail survey examined the Stillwater population's involvement in wildlife enhancement activities. The low survey response, however, makes inferences about the Stillwater population based on survey results unreliable. Survey respondents were interested in residential wildlife, but results indicated that non-response bias may be leading to an over estimate of this interest. Survey results may be more indicative of the attitudes of Stillwater residents interested in residential wildlife. The survey results showed that individuals involved in residential wildlife were primarily interested in encouraging birds, with mammals second. The primary methods being used

Table 16. Information or assistance desired by interview participants.

Information or assistance type	Response	
	%	(No.)
Preferred wildlife foods	70	(19)
Plants attractive to wildlife	52	(14)
Methods of providing water	41	(11)
Building bird houses or nest structures	37	(10)
Assistance in creating residential wildlife habitat	37	(10)
Where to obtain plants attractive to wildlife	33	(9)
Effects of pesticides on wildlife	30	(8)
Providing reproductive areas for wildlife	26	(7)
Assistance in avoiding and getting rid of wildlife pests	26	(7)
Attracting wildlife to apartments	15	(4)

Table 17. Benefits of residential wildlife cited by interview participants.

Benefit	Response	
	%	(No.)
Enjoyment	94	(33)
Helping wildlife survive winter	77	(27)
Beauty	74	(26)
Insect pest control	54	(19)
Education	51	(18)
Preservation of natural resources	26	(9)
Increasing property value	11	(4)

to encourage wildlife were provision of supplemental food and water.

Stillwater interview participants were volunteers, identified in the mail survey as being involved in wildlife attraction. This group was atypical when compared to the Stillwater population. Interview participants represented more professional or technical careers, were older, and more of them were home owners than the general population. Results of this survey should be representative of Stillwater residents interested in residential wildlife attraction.

Interview participants, like mail survey respondents, were primarily interested in attracting birds and were providing supplemental food and water for them. Interview participants were having some problems with residential wildlife. The problems causing the greatest concern were wildlife depredation of gardens and conflicts between pets and wildlife. The benefits of residential wildlife, however, appeared to outweigh any problems. Interview participants appeared to have difficulty with detecting changes in wildlife observed at their residence since initiation of enhancement activities. This indicated a lack of ability in identifying wildlife species and/or a lack of record keeping.

Survey results suggested that an educational program dealing with wildlife would be valuable to interested Stillwater residents. Instruction in wildlife ecology and the role of residential wildlife should be useful. An educational program should include instruction on wildlife identification. Instruction on preferred wildlife foods and how to obtain them at the lowest cost, along with information on other attraction methods should be valuable to interested residents. Instruction on avoiding wildlife related problems and dealing with free-

roaming pets would be helpful to both residents and wildlife. An educational program of this nature would be directed at individuals already interested in residential wildlife. However, exposure to this type information may interest others in residential wildlife attraction.

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APPENDIX A

STILLWATER MAIL

QUESTIONNAIRE



Oklahoma Cooperative Wildlife
Research Unit
404 Life Sciences West
Oklahoma State University
Stillwater, Oklahoma 74074

Nonprofit
Organization
U. S. POSTAGE
PAID
Permit No. 191
Stillwater, Oklahoma

1. Do you encourage wildlife at your residence by providing food, water, and/or shelter? Yes NO
If No, please answer only questions 2-4.
If Yes, please go to question 4.
2. Do you enjoy having wildlife at your residence?
 Yes No Indifferent
3. If provided with information and/or assistance with attracting wildlife to your residence, would you attempt to attract wildlife?
 Yes No Undecided
4. Do you own or rent your home?
5. Please check those wildlife groups that you encourage at your residence. Birds Mammals Reptiles and Amphibians
6. What methods do you use to encourage wildlife?
 Feeding Providing bird houses and/or nest boxes
 Providing water Other (Please specify) _____
 Planting trees, shrubs, etc. _____
7. Since you began encouraging wildlife at your residence has the variety of wildlife seen there increased decreased
 remained the same uncertain?
8. Approximately how many years have you made efforts to encourage wildlife at this address? 0-5 6-10 11-15 16-20
 more than 20
9. Would you be willing to let me call on you to obtain additional information on wildlife in residential areas? Yes No
10. If you answered yes to question 9, please give your name, address, and telephone number (they will be kept confidential).

11. What day and time would be convenient for you? _____ am
Day _____ Time _____ pm
12. Will you be available during the summer? Yes No
13. Comments? _____

THANK YOU

Dear Stillwater Resident,

May 1979

We need your help! We are conducting a survey of wildlife enhancement activities in residential areas, in cooperation with the Oklahoma Cooperative Wildlife Research Unit located at Oklahoma State University. As a part of this project we would like to know if you actively encourage wildlife by providing food, water, and/or shelter at your residence. Wildlife as used here refers to naturally occurring ("wild") birds, mammals, reptiles, and amphibians.

Please take a minute to complete this short and completely confidential questionnaire, detach it, and drop it in the mail. Postage has been paid. If you have any questions or comments regarding this survey, please call me at the number given below.

Thank you very much for your time and help.

Department of Ecology,
Fisheries, and Wildlife
624-5550 extension 5

Sincerely,

Jennifer Yeomans
Jennifer Yeomans
Graduate Assistant

DETACH HERE

NO POSTAGE STAMP NECESSARY
POSTAGE HAS BEEN PREPAID BY

Oklahoma Cooperative Wildlife
Research Unit
404 Life Sciences West
Oklahoma State University
Stillwater, Oklahoma 74074

APPENDIX B

STILLWATER INTERVIEW

QUESTIONNAIRE

SURVEY
OF
RESIDENTIAL WILDLIFE ATTRACTION

Number _____
Date _____

1. How many years have you been encouraging wildlife at your residence? _____
2. Please check those wildlife groups that you encourage at your residence.
- Birds Reptiles (Snakes, Lizards, Turtles)
- Mammals Amphibians (Frogs, Toads, Salamanders)

The following questions refer to METHODS you have USED TO ENCOURAGE WILDLIFE at your residence.

3. Planted trees for food and/or cover
- Conifers (Evergreens, Cedars, Pines) No Yes, number _____
- Deciduous Trees No Yes, number _____
4. Planted shrubs for food and/or cover
- Conifers (Evergreens, Cedars, Pines) No Yes, number _____
- Deciduous Shrubs No Yes, number _____
5. Planted flowers, vines, grasses, or other herbaceous plants for food and/or cover. No Yes
6. Since September 1978, have you provided water for wildlife? No Yes
- a. If you answered "yes" to 6, please check seasons water is provided.
- Spring Summer Fall Winter
- b. If you answered "yes" to 6, please check methods used to provide water
- Bird bath Water bottles for squirrels
- Heated bird bath Artificial waterfall and/or stream
- Fountain
- Pan or other container Other (please specify) _____
- on ground or blocks
- Built a pond
7. Since September 1978, have you provided supplementary food for wildlife?
- Yes No
- a. If you answered "yes" to 7, please check seasons food is provided.
- Spring Summer Fall Winter
- b. If you answered "yes" to 7, please fill in the estimated amount of each type of food provided for wildlife since September 1978. If the amount is unknown, check the type of food provided.
- | | | |
|---|--|---|
| <input type="checkbox"/> Pre-mixed wild bird seed | <input type="checkbox"/> Corn | <input type="checkbox"/> Fruits |
| <input type="checkbox"/> "Scratch" feed | <input type="checkbox"/> Barley | <input type="checkbox"/> Hummingbird nectar |
| <input type="checkbox"/> Milo | <input type="checkbox"/> Suet or Fat | <input type="checkbox"/> Other (Please specify _____) |
| <input type="checkbox"/> Wheat | <input type="checkbox"/> Table scraps | _____ |
| <input type="checkbox"/> Thistle | <input type="checkbox"/> Bakery products | _____ |
| <input type="checkbox"/> Millet | <input type="checkbox"/> Nutmeats | _____ |
8. Please record the number of bird houses available at your residence. _____
- a. Please record the number of available bird houses at your residence used by birds in 1979. _____

b. Please indicate the bird species using these bird houses.

_____	_____	_____
_____	_____	_____
_____	_____	_____

c. Please record the number of nest boxes available for squirrels at your residence.

d. Please record the number of available nest boxes at your residence used by squirrels in 1979. _____

9. Have you made changes in general lawn care in order to attract wildlife to your residence? Yes No

a. If you answered "yes" to 9, please indicate types of changes made.

<input type="checkbox"/> Mow lawn less often	<input type="checkbox"/> Make compost piles	<input type="checkbox"/> Limited pesticide use
<input type="checkbox"/> Mow smaller area	<input type="checkbox"/> Let flowers and weeds go to seed	<input type="checkbox"/> Other (please specify) _____
<input type="checkbox"/> No raking	<input type="checkbox"/> Prune trees and shrubs less often	_____
<input type="checkbox"/> Make brush piles		_____
<input type="checkbox"/> Make rock piles		_____

Please check those species of wildlife you have seen at your residence.

10. Amphibians and Reptiles

<input type="checkbox"/> Box Turtle	<input type="checkbox"/> Great Plains Toad	<input type="checkbox"/> Cricket Frog
<input type="checkbox"/> Red-eared Turtle	<input type="checkbox"/> American Toad	<input type="checkbox"/> Bull Frog
<input type="checkbox"/> Common Snapping Turtle	<input type="checkbox"/> Woodhouses Toad	<input type="checkbox"/> Southern Leopard Frog
<input type="checkbox"/> Turtle, species unknown	<input type="checkbox"/> Toad, species unknown	<input type="checkbox"/> Gray Tree Frog
		<input type="checkbox"/> Frog, species unknown
<input type="checkbox"/> Horned Lizard ("Toad")	<input type="checkbox"/> Lined Snake	<input type="checkbox"/> Brown Snake
<input type="checkbox"/> Collared Lizard	<input type="checkbox"/> Ring-necked Snake	<input type="checkbox"/> Snake, species unknown
<input type="checkbox"/> (Mountain Boomer)	<input type="checkbox"/> Eastern Coachwhip	
<input type="checkbox"/> Prairie Racerunner	<input type="checkbox"/> Black Rat Snake	
<input type="checkbox"/> Fence Lizard	<input type="checkbox"/> Speckled King Snake	
<input type="checkbox"/> Five-lined Skink	<input type="checkbox"/> Prairie King Snake	
<input type="checkbox"/> Lizard, Species unknown	<input type="checkbox"/> Garter Snake	

11. Mammals

<input type="checkbox"/> Fox Squirrel	<input type="checkbox"/> Rats (varieties)	<input type="checkbox"/> Beaver
<input type="checkbox"/> 13-lined Ground Squirrel	<input type="checkbox"/> Bats	<input type="checkbox"/> Bobcat
<input type="checkbox"/> Pocket Gopher	<input type="checkbox"/> Opossum	<input type="checkbox"/> Coyote
<input type="checkbox"/> Flying Squirrel	<input type="checkbox"/> Eastern Mole	<input type="checkbox"/> White-tailed Deer
<input type="checkbox"/> Striped Skunk	<input type="checkbox"/> Cottontail Rabbit	<input type="checkbox"/> Others (please specify) _____
<input type="checkbox"/> Muskrat	<input type="checkbox"/> Armadillo	_____
<input type="checkbox"/> Mice (varieties)	<input type="checkbox"/> Raccoon	_____

12. Winter Birds (November-March)

<input type="checkbox"/> Mallard	<input type="checkbox"/> Tufted Titmouse	<input type="checkbox"/> House Sparrow
<input type="checkbox"/> American Kestrel	<input type="checkbox"/> White-breasted Nuthatch	<input type="checkbox"/> Eastern Meadowlark
<input type="checkbox"/> Sharp-shinned Hawk	<input type="checkbox"/> Brown Creeper	<input type="checkbox"/> Common Grackle
<input type="checkbox"/> Bobwhite Quail	<input type="checkbox"/> Carolina Wren	<input type="checkbox"/> Brown-headed Cowbird
<input type="checkbox"/> Mourning Dove	<input type="checkbox"/> Mockingbird	<input type="checkbox"/> Purple Finch
<input type="checkbox"/> Roadrunner	<input type="checkbox"/> Eastern Bluebird	<input type="checkbox"/> Pine Siskin
<input type="checkbox"/> Common Flicker	<input type="checkbox"/> American Robin	<input type="checkbox"/> American Goldfinch
<input type="checkbox"/> Red-bellied Woodpecker	<input type="checkbox"/> Cedar Waxwing	<input type="checkbox"/> Dark-eyed Junco
<input type="checkbox"/> Downy Woodpecker	<input type="checkbox"/> Loggerhead Shrike	<input type="checkbox"/> Tree Sparrow
<input type="checkbox"/> Blue Jay	<input type="checkbox"/> Starling	<input type="checkbox"/> Harris Sparrow
<input type="checkbox"/> Carolina Chickadee	<input type="checkbox"/> Yellow-rumped Warbler	<input type="checkbox"/> Field Sparrow

13. Summer Birds (April-October)

<input type="checkbox"/> Mallard	<input type="checkbox"/> Eastern Kingbird	<input type="checkbox"/> Eastern Bluebird
<input type="checkbox"/> American Kestrel	<input type="checkbox"/> Western Kingbird	<input type="checkbox"/> Loggerhead Shrike
<input type="checkbox"/> Bobwhite Quail	<input type="checkbox"/> Barn Swallow	<input type="checkbox"/> Starling
<input type="checkbox"/> Green Heron	<input type="checkbox"/> Purple Martin	<input type="checkbox"/> House Sparrow
<input type="checkbox"/> Mourning Dove	<input type="checkbox"/> Blue Jay	<input type="checkbox"/> Eastern Meadowlark
<input type="checkbox"/> Yellow-billed Cuckoo	<input type="checkbox"/> Carolina Chickadee	<input type="checkbox"/> Northern Oriole
<input type="checkbox"/> Roadrunner	<input type="checkbox"/> Tufted Titmouse	<input type="checkbox"/> ("Baltimore")
<input type="checkbox"/> Chimney Swift	<input type="checkbox"/> White-breasted Nuthatch	<input type="checkbox"/> Brown-headed Cowbird
<input type="checkbox"/> Ruby-throated Hummingbird	<input type="checkbox"/> Bewicks Wren	<input type="checkbox"/> Common Grackle
<input type="checkbox"/> Common Flicker	<input type="checkbox"/> Carolina Wren	<input type="checkbox"/> Cardinal
<input type="checkbox"/> Red-bellied Woodpecker	<input type="checkbox"/> Mockingbird	<input type="checkbox"/> Indigo Bunting
<input type="checkbox"/> Downy Woodpecker	<input type="checkbox"/> Brown Thrasher	<input type="checkbox"/> American Goldfinch
<input type="checkbox"/> Scissor-tailed Flycatcher	<input type="checkbox"/> American Robin	

14. Please indicated below the changes in variety of wildlife observed at your residence since you began encouraging wildlife.

	<u>INCREASED</u>	<u>NO CHANGE</u>	<u>DECREASED</u>	<u>DON'T KNOW</u>
a. Winter Birds	_____	_____	_____	_____
b. Summer Birds	_____	_____	_____	_____
c. Mammals	_____	_____	_____	_____
d. Amphibians (Frogs, Toads, etc.)	_____	_____	_____	_____
e. Reptiles (Snakes, Lizards, Turtles)	_____	_____	_____	_____

15. Please indicate below the changes in total numbers of wildlife observed at your residence since you began encouraging wildlife.

	<u>INCREASED</u>	<u>NO CHANGE</u>	<u>DECREASED</u>	<u>DON'T KNOW</u>
a. Winter Birds	_____	_____	_____	_____
b. Summer Birds	_____	_____	_____	_____
c. Mammals	_____	_____	_____	_____
d. Amphibians (Frogs, Toads, etc.)	_____	_____	_____	_____
e. Reptiles (Snakes, Lizards, Turtles)	_____	_____	_____	_____

16. What problems have you encountered in attracting wildlife?

<input type="checkbox"/> No success	<input type="checkbox"/> Dogs or cats scaring wildlife
<input type="checkbox"/> Attracting undesirable species	<input type="checkbox"/> Children scaring wildlife
<input type="checkbox"/> Lack of information on attracting wildlife	<input type="checkbox"/> Adjacent landuse disturbance
<input type="checkbox"/> Vandalism to feeders, bird houses, nest boxes, etc.	<input type="checkbox"/> Bees or wasps in bird houses or nest boxes
<input type="checkbox"/> Getting enough feed	<input type="checkbox"/> Other (please specify) _____

17. What problems have you attributed to backyard wildlife?
 Dirty (droppings, etc.) Damage to house or other buildings
 Spread diseases Attracting dogs and cats
 Noisy Other (please specify) _____
 Damage to lawn, shrubs, trees, fruit, or gardens _____
18. Which types of wildlife have caused the most problems at your residence?
 Starlings Woodpeckers Ground Squirrels Other (please specify)
 Blue Jays Rabbits Moles
 House Sparrows Squirrels Gophers
 Snakes
- 19a. Have you observed cats frightening wildlife at your residence? Yes No
- b. Do you feel cats are keeping wildlife away from your residence?
 Yes No Unsure
- c. Have you observed cats killing wildlife at your residence? Yes No
- d. If you answered "yes" to 19c, on how many occasions have you observed this since September 1978? _____
- e. Have you observed indirect evidence of cats killing wildlife at your residence?
 Yes No
- f. If you answered "yes" to 19e, on how many occasions have you observed this since September 1978? _____
- g. What types of wildlife have been killed by cats at your residence?
 Birds Amphibians (Frogs, Toads, Salamanders)
 Mammals Reptiles (Snakes, Lizards, Turtles)
- h. Have you attempted to solve these cat/wildlife problems at your residence?
 Yes No
- i. If you answered "yes" to 19h, have you been _____
 unsuccessful
 fairly successful
 highly successful
- j. Do you need assistance in solving cat/wildlife problems? Yes No
- 20a. Have you observed animals other than cats killing wildlife at your residence?
 Yes No
- b. If you answered "yes" to 20a, on how many occasions have you observed this since September 1978? _____
- c. Have you seen indirect evidence of animals other than cats killing wildlife at your residence? Yes No
- d. If you answered "yes" to 20c, on how many occasions have you observed this since September 1978? _____
- e. What kinds of animals other than cats have you observed killing wildlife at your residence?
 Dogs Coyotes Hawks Other (please specify) _____
 Skunks Raccoons Owls
 Snakes

21. What benefits have you derived from encouraging wildlife at your residence?
- | | |
|--|--|
| <input type="checkbox"/> Beauty | <input type="checkbox"/> Preservation of natural resources |
| <input type="checkbox"/> Enjoyment | <input type="checkbox"/> Helping wildlife survive the winter |
| <input type="checkbox"/> Education | <input type="checkbox"/> Insect pest control |
| <input type="checkbox"/> Increasing property value | <input type="checkbox"/> Other (please specify) _____ |
22. Please check the estimated amount of money spent assisting wildlife at your residence since September 1978.
- | | | | | |
|----------------------------------|------------------------------------|------------------------------------|------------------------------------|--|
| <input type="checkbox"/> \$0-25 | <input type="checkbox"/> \$76-100 | <input type="checkbox"/> \$201-250 | <input type="checkbox"/> \$351-400 | <input type="checkbox"/> \$501 or more |
| <input type="checkbox"/> \$26-50 | <input type="checkbox"/> \$101-150 | <input type="checkbox"/> \$251-300 | <input type="checkbox"/> \$401-450 | |
| <input type="checkbox"/> \$51-75 | <input type="checkbox"/> \$151-200 | <input type="checkbox"/> \$301-350 | <input type="checkbox"/> \$451-500 | |
23. Rank from 1 - 10 the types of information or assistance that would be most helpful to you in dealing with wildlife at your residence.
- | | |
|--|---|
| <input type="checkbox"/> Plants attractive to wildlife | <input type="checkbox"/> Effects of pesticides on wildlife |
| <input type="checkbox"/> Where to obtain plants attractive to wildlife | <input type="checkbox"/> Attracting wildlife to apartments |
| <input type="checkbox"/> Preferred foods of various wildlife species | <input type="checkbox"/> Assistance in making your yard better wildlife habitat |
| <input type="checkbox"/> Methods of providing water for wildlife | <input type="checkbox"/> Assistance in avoiding and getting rid of wildlife pests |
| <input type="checkbox"/> Providing reproductive areas for wildlife | Please add any others _____ |
| <input type="checkbox"/> Building nest structures and bird houses | _____ |
24. How would you rate your attempts to encourage wildlife at your residence?
- Unsuccessful Fairly successful Highly successful
25. Have you received complaints from neighbors about you encouragement of wildlife?
- Yes No
26. Have you received complaints from city officials about you encouragement of wildlife?
- Yes No
27. Have your wildlife attracting activities encouraged other people to become involved in encouraging wildlife?
- Yes No
28. Have you heard of the National Wildlife Federation's Backyard wildlife program?
- Yes No

General Information

29. Do you own or rent your home?
30. How many years have you lived at this address? _____
31. Do you live inside or outside the Stillwater city limits?
32. How many years ago was your home built? _____
33. What is the distance to your nearest neighbor? _____
34. What size is the lot on which your residence is located? _____

- 35a. How many dogs do you have? _____
- b. How many cats do you have? _____
- c. Do your neighbors have dogs or cats that get into your yard? ___Yes ___No
- d. Do these pets pose a serious problem for wildlife? ___Yes ___No
- 36a. How many children under 16 live with you? _____
- b. How many children under 16 live in the houses adjacent to yours? _____
37. Please check the highest level of education you have completed.
- | | |
|--|--|
| <input type="checkbox"/> Elementary School | <input type="checkbox"/> Graduate Work |
| <input type="checkbox"/> Junior High School | <input type="checkbox"/> Professional School |
| <input type="checkbox"/> Senior High School | <input type="checkbox"/> Vocational/Technical School |
| <input type="checkbox"/> College or University | |
38. Occupation of head of household? _____

USE THIS SPACE FOR ANY ADDITIONAL COMMENTS

THANK YOU !

APPENDIX C

BACKYARD WILDLIFE PROGRAM

QUESTIONNAIRE

SURVEY
OF
RESIDENTIAL WILDLIFE ATTRACTION

Number _____
Date _____

- 1a. How many years have you been encouraging wildlife at your residence? _____
- b. When did you receive certification of your backyard through the National Wildlife Federation's backyard wildlife program? _____
2. Please check those wildlife groups that you encourage at your residence.
- Birds Reptiles (Snakes, Lizards, Turtles)
 Mammals Amphibians (Frogs, Toads, Salamanders)

The following questions refer to METHODS you have USED TO ENCOURAGE WILDLIFE at your residence.

3. Planted trees for food and/or cover
- Conifers (Evergreens, Cedars, Pines) No Yes, number _____
Deciduous Trees No Yes, number _____
4. Planted shrubs for food and/or cover
- Conifers (Evergreens, Cedars, Pines) No Yes, number _____
Deciduous Shrubs No Yes, number _____
5. Planted flowers, vines, grasses, or other herbaceous plants for food and/or cover. No Yes
6. Since September 1978, have you provided water for wildlife? No Yes
- a. If you answered "yes" to 6, please check seasons water is provided.
- Spring Summer Fall Winter
- b. If you answered "yes" to 6, please check methods used to provide water
- Bird bath Water bottles for squirrels
 Heated bird bath Artificial waterfall and/or
 Fountain stream
 Pan or other container on ground or blocks Other (please specify) _____
 Built a pond _____
7. Since September 1978, have you provided supplementary food for wildlife?
 Yes No
- a. If you answered "yes" to 7, please fill in the estimated amount of each type of food provided for wildlife since September 1978. If the amount is unknown check the type of food provided.
- | | | |
|---|--|---|
| <input type="checkbox"/> Pre-mixed wild bird seed | <input type="checkbox"/> Corn | <input type="checkbox"/> Fruits |
| <input type="checkbox"/> "Scratch" feed | <input type="checkbox"/> Barley | <input type="checkbox"/> Hummingbird nectar |
| <input type="checkbox"/> Milo | <input type="checkbox"/> Suet or Fat | <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> Wheat | <input type="checkbox"/> Table scraps | _____ |
| <input type="checkbox"/> Thistle | <input type="checkbox"/> Bakery products | _____ |
| <input type="checkbox"/> Millet | <input type="checkbox"/> Nutmeats | _____ |
8. Please record the number of bird houses available at your residence. _____
- a. Please record the number of available bird houses at your residence used by birds in 1979. _____

b. Please indicate the bird species using these bird houses.

_____	_____	_____
_____	_____	_____
_____	_____	_____

c. Please record the number of nest boxes available for squirrels at your residence.

d. Please record the number of available nest boxes at your residence used by squirrels in 1979.

9. Have you made changes in general lawn care in order to attract wildlife to your residence? Yes No

a. If you answered "yes" to 9, please indicate types of changes made.

<input type="checkbox"/> Mow lawn less often	<input type="checkbox"/> Make compost piles	<input type="checkbox"/> Limited pesticide use
<input type="checkbox"/> Mow smaller area	<input type="checkbox"/> Let flowers and weeds	<input type="checkbox"/> Other (please specify) _____
<input type="checkbox"/> No raking	<input type="checkbox"/> go to seed	_____
<input type="checkbox"/> Make brush piles	<input type="checkbox"/> Prune trees and shrubs	_____
<input type="checkbox"/> Make rock piles	<input type="checkbox"/> less often	_____

10. List in order of decreasing frequency of observation, the 5 most common mammals seen at your residence during a given year (1 being the most common mammal).

- 1.
- 2.
- 3.
- 4.
- 5.

11. List in order of decreasing frequency of observation, the 5 most common reptiles (snakes, lizards, turtles) seen at your residence during a given year (1 being the most common reptile).

- 1.
- 2.
- 3.
- 4.
- 5.

12. List in order of decreasing frequency of observation, the 5 most common amphibians (toads, frogs, salamanders) seen at your residence during a given year (1 being the most common amphibian).

- 1.
- 2.
- 3.
- 4.
- 5.

13. List in order of decreasing frequency of observation, the 5 most common winter birds (November-March) seen at your residence during a given year (1 being the most common bird).

- 1.
- 2.
- 3.
- 4.
- 5.

14. List in order of decreasing frequency of observation, the 5 most common summer birds (April-October) seen at your residence during a given year (1 being the most common bird).
1. _____
 2. _____
 3. _____
 4. _____
 5. _____
15. Please indicate below the change in variety of wildlife observed at your residence since you began encouraging wildlife.
- | | <u>INCREASED</u> | <u>NO CHANGE</u> | <u>DECREASED</u> | <u>DON'T KNOW</u> |
|---|------------------|------------------|------------------|-------------------|
| a. Winter Birds | _____ | _____ | _____ | _____ |
| b. Summer Birds | _____ | _____ | _____ | _____ |
| c. Mammals | _____ | _____ | _____ | _____ |
| d. Amphibians
(Frogs, Toads, etc.) | _____ | _____ | _____ | _____ |
| e. Reptiles
(Snakes, Lizards, Turtles) | _____ | _____ | _____ | _____ |
16. Please indicate below the changes in total numbers of wildlife observed at your residence since you began encouraging wildlife.
- | | <u>INCREASED</u> | <u>NO CHANGE</u> | <u>DECREASED</u> | <u>DON'T KNOW</u> |
|---|------------------|------------------|------------------|-------------------|
| a. Winter Birds | _____ | _____ | _____ | _____ |
| b. Summer Birds | _____ | _____ | _____ | _____ |
| c. Mammals | _____ | _____ | _____ | _____ |
| d. Amphibians
(Frogs, Toads, etc.) | _____ | _____ | _____ | _____ |
| e. Reptiles
(Snakes, Lizards, Turtles) | _____ | _____ | _____ | _____ |
17. What problems have you encountered in attracting wildlife?
- | | |
|---|--|
| ___ No success | ___ Dogs or cats scaring wildlife |
| ___ Attracting undesirable species | ___ Children scaring wildlife |
| ___ Lack of information on attracting wildlife | ___ Adjacent landuse disturbance |
| ___ Vandalism to feeders, bird houses, nest boxes, etc. | ___ Bees or wasps in bird houses or nest boxes |
| ___ Getting enough feed | ___ Other (please specify) _____ |
18. What problems have you attributed to wildlife at your residence?
- | | |
|---|--|
| ___ Dirty (droppings, etc.) | ___ Damage to house or other buildings |
| ___ Spread diseases | ___ Attracting dogs and cats |
| ___ Noisy | ___ Other (please specify) _____ |
| ___ Damage to lawn, shrubs trees, fruit, or gardens | _____ |

19. Which types of wildlife have caused the most problems at your residence?
- | | | | |
|---|-------------------------------------|---|---|
| <input type="checkbox"/> Starlings | <input type="checkbox"/> Woodpecker | <input type="checkbox"/> Ground Squirrels | <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> Blue Jays | <input type="checkbox"/> Rabbits | <input type="checkbox"/> Moles | |
| <input type="checkbox"/> House Sparrows | <input type="checkbox"/> Squirrels | <input type="checkbox"/> Gophers | |
| | <input type="checkbox"/> Snakes | | |
- 20a. Have you observed cats frightening wildlife at your residence? Yes No
- b. Do you feel cats are keeping wildlife away from your residence?
 Yes No Unsure
- c. Have you observed cats killing wildlife at your residence? Yes No
- d. If you answered "yes" to 20c, on how many occasions have you observed this since September 1978? _____
- e. Have you observed indirect evidence of cats killing wildlife at your residence?
 Yes No
- f. If you answered "yes" to 20e, on how many occasions have you observed this since September 1978? _____
- g. What types of wildlife have been killed by cats at your residence?
 Birds Amphibians (Frogs, Toads, Salamanders)
 Mammals Reptiles (Snakes, Lizards, Turtles)
- h. Have you attempted to solve these cat/wildlife problems at your residence?
 Yes No
- i. If you answered "yes" to 20h, have you been _____
 unsuccessful
 fairly successful
 highly successful
- j. Do you need assistance in solving cat/wildlife problems? Yes No
- 21a. Have you observed animals other than cats killing wildlife at your residence?
 Yes No
- b. If you answered "yes" to 21a, on how many occasions have you observed this since September 1978? _____
- c. Have you seen indirect evidence of animals other than cats killing wildlife at your residence? _____
- d. If you answered "yes" to 21c, on how many occasions have you observed this since September 1968? _____
- e. What kinds of animals other than cats have you observed killing wildlife at your residence?
- | | | | |
|---------------------------------|----------------------------------|---------------------------------|---|
| <input type="checkbox"/> Dogs | <input type="checkbox"/> Coyotes | <input type="checkbox"/> Hawks | <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> Skunks | <input type="checkbox"/> Racoons | <input type="checkbox"/> Owls | |
| | | <input type="checkbox"/> Snakes | |
22. What benefits have you derived from encouraging wildlife at your residence?
- | | |
|--|--|
| <input type="checkbox"/> Beauty | <input type="checkbox"/> Preservation of natural resources |
| <input type="checkbox"/> Enjoyment | <input type="checkbox"/> Helping wildlife survive the winter |
| <input type="checkbox"/> Education | <input type="checkbox"/> Insect pest control |
| <input type="checkbox"/> Increasing property value | <input type="checkbox"/> Other (please specify) _____ |

23. Please check the estimated amount of money spent assisting wildlife at your residence since September 1978.
- | | | | |
|-----------------------------------|------------------------------------|------------------------------------|--|
| <input type="checkbox"/> \$0-25 | <input type="checkbox"/> \$101-150 | <input type="checkbox"/> \$301-350 | <input type="checkbox"/> \$501 or more |
| <input type="checkbox"/> \$26-50 | <input type="checkbox"/> \$151-200 | <input type="checkbox"/> \$350-400 | |
| <input type="checkbox"/> \$51-75 | <input type="checkbox"/> \$201-250 | <input type="checkbox"/> \$401-450 | |
| <input type="checkbox"/> \$76-100 | <input type="checkbox"/> \$251-300 | <input type="checkbox"/> \$451-500 | |
24. Since your backyard was certified as wildlife habitat have you continued to assist wildlife in your backyard? Yes No
25. Have you taken additional steps since certification to make your backyard better wildlife habitat? Yes No
26. How would you rate your attempts to encourage wildlife at your residence?
 Unsuccessful Fairly successful Highly successful
27. Have you received complaints from neighbors about your wildlife assistance?
 Yes No
28. Have you received complaints from city officials about your wildlife assistance?
 Yes No
29. Have your wildlife attracting activities encouraged other people to become involved in encouraging wildlife? Yes No

General Information

30. Do you live inside or outside the city limits?
31. Do you own or rent your home?
32. How many years have you lived at this address? _____
33. How many years ago was your home built? _____
34. What is the distance to your nearest neighbor? _____
35. What size is the lot on which your residence is located? _____
36. Please check the age class of the majority of the vegetation at your residence.
 New vegetation (planted 0-10 years ago).
 Intermediate vegetation (planted 11-29 years ago).
 Mature vegetation (planted 30 or more years ago).
- 37a. How many dogs do you have? _____
- b. How many cats do you have? _____
- c. Do your neighbors have dogs or cats that get into your yard? Yes No
- d. Do these pets pose a serious problem for wildlife? Yes No

- 38a. How many children under 16 live with you? _____
- b. How many children under 16 live in the houses adjacent to yours? _____
39. Please check the highest level of education you have completed.
- | | |
|--|--|
| <input type="checkbox"/> Elementary School | <input type="checkbox"/> Graduate Work |
| <input type="checkbox"/> Junior High School | <input type="checkbox"/> Professional School |
| <input type="checkbox"/> Senior High School | <input type="checkbox"/> Vocational/Technical School |
| <input type="checkbox"/> College or University | |
40. Occupation of head of household? _____

USE THIS SPACE TO WRITE ANY ADDITIONAL COMMENTS ABOUT BACKYARD WILDLIFE OR THE BACKYARD
WILDLIFE PROGRAM

THANK YOU !

OKLAHOMA COOPERATIVE WILDLIFE RESEARCH UNIT

OKLAHOMA STATE UNIVERSITY
404 LIFE SCIENCES WEST
STILLWATER, OKLAHOMA 74074
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COOPERATING AGENCIES:

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION
OKLAHOMA STATE UNIVERSITY
WILDLIFE MANAGEMENT INSTITUTE
FISH AND WILDLIFE SERVICE
U. S. DEPARTMENT OF THE INTERIOR

September 1979

Participants
Backyard Wildlife Program
National Wildlife Federation

Dear Participant,

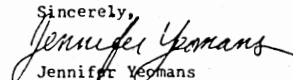
We need your help! We are conducting a study of wildlife enhancement activities in residential areas in cooperation with the National Wildlife Federation, which provided funding for this study. As a part of this study we are turning to you, a participant in the Backyard Wildlife Program, for insights on what works in attracting wildlife, where the problems lie, and what recommendations could be made to others interested in backyard wildlife.

Your ideas on the pro's and con's of backyard wildlife will help us work towards a comfortable coexistence between residents and backyard wildlife that will be beneficial to both. Your ideas will also help update the Backyard Wildlife Program, so that the program can be more effective in assisting you.

Please complete this questionnaire and drop it in the mail as soon as possible. All responses will be kept confidential. Postage has been paid. Please don't forget! Your assistance is urgently needed. If you have any questions regarding this study, feel free to contact me.

Thank you for your time and help.

Sincerely,



Jennifer Yeomans
Graduate Assistant
(405) 624-5550
extension 5

VITA

Jennifer Ann Yoemans

Candidate for the Degree of

Master of Science

Thesis: AN EVALUATION OF WILDLIFE ENHANCEMENT ACTIVITIES IN THE
RESIDENTIAL CONTEXT

Major Field: Wildlife Ecology

Biographical:

Personal Data: Born Grand Rapids, Michigan, September 8, 1955, the
daughter of Mr. and Mrs. Edward J. Yeomans.

Education: Graduated from Holland Christian High School, Holland,
Michigan, in June, 1973; received a Bachelor of Arts degree in
Biology from Hope College, Holland Michigan, in May, 1977;
completed requirements for the Master of Science degree at
Oklahoma State University, Stillwater, Oklahoma, in July, 1981.

Professional Experience: Research Technician, Biology Department,
Hope College, May, 1976 to August, 1976; graduate teaching
assistant, School of Biological Sciences, Oklahoma State
University, August, 1977 to December, 1980; research
technician, Veteran's Administration, Medical Center, Oklahoma
City, Oklahoma, January, 1981 to present.

Professional Societies: The Wildlife Society.