

**Final Report to the Environmental Review Commission on
Pilot Coyote Management Assistance Program in Mitchell County
January 20th, 2017**

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N.C. House of Representatives
300 N. Salisbury Street, Room 416B
Raleigh, NC 27603-5925

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N.C. Senate
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Honorables:

The 2015 General Assembly directed the North Carolina Wildlife Resources Commission (NCWRC) to establish and implement a pilot coyote management assistance program in Mitchell County to document and assess private property damage, evaluate control methodologies, and evaluate the potential for a scalable statewide program. I am submitting this final report to the Environmental Review Commission in fulfillment of the requirements of Section 4.35. (a) and Section 4.35. (b) of Session Law 2015-286 (H765).

If you have questions or need additional information, please contact me by phone at (919) 707-0151 or via email at gordon.myers@ncwildlife.org.

Respectfully,

Gordon Myers
Executive Director

Introduction

The North Carolina Wildlife Resources Commission (NCWRC) conserves North Carolina's wildlife resources and their habitats and provides programs and opportunities that allow hunters, anglers, boaters and other outdoor enthusiasts to enjoy wildlife-associated recreation. As outlined in our strategic plan, the commission will evaluate and improve the effectiveness of regulatory programs designed to promote wildlife conservation by establishing a comprehensive framework to ensure sustainable wildlife resources. By implementing wildlife management plans, we can attempt to address the impact of predators and other wildlife species.

The 2015 General Assembly directed the NCWRC to establish a coyote management plan to address the impacts of coyotes and the threats that coyotes pose to citizens, industries, and populations of native wildlife species within the State. The Wildlife Resources Commission reported its findings and recommendations to the Environmental Review Commission on March 1, 2016.

In addition, the NCWRC was directed to establish a pilot coyote management assistance program in Mitchell County. In implementing the program, the Commission was required document and assess private property damage associated with coyotes; evaluate effectiveness of different coyote control methodologies, including lethal removal; and evaluate potential for a scalable statewide coyote assistance program. A final report on the results of the pilot program, including proposed legislation was to be submitted to the Environmental Review Commission by January 15th, 2017. This report fulfills the requirement of Section 4.35.(b) of SL 2015-286.

Background and Approach

Coyotes are typically elusive animals that avoid direct contact with humans and are most active after dusk and before daylight. They are usually only seen at a distance and may be heard more often than seen. Most citizens have little direct personal experience with coyotes, as coyote behavior minimizes their contact with humans. However, the potential for negative coyote/human interactions and associated property damage and economic loss do exist in both rural and urban settings. Management efforts for coyotes must be broad and adaptable in nature to be successful.

The NCWRC established a working group to address the action items outlined in statute (Section 4.35. (a)) based on recommendations and constituent desires determined through social research. An initial meeting with Senator Ralph Hise, Mitchell County officials, livestock owners and livestock producers, and NCWRC staff took place on November 30, 2015 in Spruce Pine. The purpose of this meeting was to determine the most effective approach to meeting

both the legislative and constituent needs related to concerns of coyote depredation on livestock.

The constituents in attendance stated that livestock predation was the primary type of property damage caused by coyotes in Mitchell County, and outlined immediate needs and potential solutions. The findings provided clarity for addressing the specifics of coyote issues in Mitchell County. The following objectives were identified as components necessary of a pilot coyote management assistance program in Mitchell County:

1. Increase understanding of coyote/human/livestock interactions, specifically depredation incidents in Mitchell County;
2. Provide public outreach related to coyote biology and coyote management;
3. Develop a communication system to place landowners in direct contact with individuals qualified to assess and address coyote depredation; and
4. Educate constituents on coyote management options and available coyote depredation management techniques.

Summary and Evaluation of Objectives

1. Increase understanding of coyote/human/livestock interactions, specifically depredation incidents in Mitchell County.

Coyotes come into contact with humans in a variety of ways, from just crossing a street or a field to chasing and attacking pets or depredating livestock or other private property. The first step in solving any conflict with wildlife is to accurately identify the source of the problem. Because coyote damage is seldom observed by humans as it is happening, heavy reliance must be placed on indirect evidence at the damage site. Not all coyotes develop predation tendencies on livestock, and coyotes that scavenge livestock carcasses may be incorrectly blamed for the deaths of those animals.

The wide range in perspectives about coyotes prompts the need to determine a fundamental understanding of the public's primary issues and concerns, their knowledge of coyote biology and management options, and their understanding of laws and regulations for addressing coyote management situations. To gain an understanding of coyote/human/livestock interactions in Mitchell County and to assess incidence of depredation, a scientific survey was developed and sent to all registered livestock producers in the county.

Survey Method

We surveyed one hundred and fifty-four (154) Mitchell County residents identified by NC Cooperative Extension staff as livestock owners. The survey asked respondents about specific damage and losses attributed to coyotes in 2015. Livestock owners were asked the number of livestock they own and the numbers and types of predation events they have observed. In addition, the survey evaluated the respondents' perception of the coyote population, their general knowledge of coyotes, and their opinions regarding specific management alternatives. An identical survey was sent to livestock owners in neighboring Yancey County. Yancey County and Mitchell County have similar livestock numbers, thus providing a control group.

The initial mailing of the survey was sent on April 7, 2016. In an effort to improve response rate, a second mailing was sent on May 12, 2016. The survey was closed on June 23, 2016. The survey was mailed in envelopes provided by the NC Cooperative Extension in an effort to capitalize on the relationship between livestock owners and their County Extension Agent.

Results from the Mitchell County survey are presented throughout this report, and both surveys and responses are provided in Appendix 1.

Data Analysis

Survey data were analyzed using IBM SPSS Statistics 24.0¹ (SPSS Inc. 2016). Frequency distributions and percentages of responses were calculated for each category and for each survey question. For bivariate comparisons, chi-square tests (χ^2) were used to test the null hypotheses that there were no differences between variables. A probability value (P-value) of ≤ 0.05 was used to indicate statistically significant relationships. Categories in cross-tabulations were omitted or combined in order to reduce the violation of the assumption that $<20\%$ of cells had expected values <5 (Delucchi 1983)². However, due to the violation, only the Likelihood Ratio was analyzed, rather than the Pearson Chi-Square. Means were calculated for questions that used a 5 point unconcerned/concerned scale (unconcerned=0, concerned=4), a 5 point not knowledgeable/knowledgeable scale (not knowledgeable=0, knowledgeable=4) or a 5 point unacceptable/acceptable scale (unacceptable=0, acceptable=4). It should be noted that due to rounding, percentages may not total 100% or may appear off when individual categories were combined.

¹ SPSS Inc. 2016. IBM SPSS Statistics, Version 24.0. SPSS Inc., Chicago, Illinois.

² Delucchi, K.L. 1983. The use and misuse of chi-square: Lewis and Burke revisited. *Psychological Bulletin* 94(1):166-176.

Survey Results & Discussion

Of the 154 surveys, 55 respondents completed and returned the survey (36%). The low sample size and response rate likely leads to some response bias in the results, as individuals who had a passionate opinion about the topic were most likely to respond.

Perceptions of Mitchell County livestock owners regarding coyote presence, abundance, and origin.

Seventy-eight percent (78%) of respondents indicated they were “extremely concerned” about coyotes on or near their farm. Specific threats to which respondents indicated they were “very concerned” were:

1. Coyotes spreading rabies (58%),
2. regular presence near farm (56%),
3. damage to the property (52%),
4. a pet being attacked (50%),
5. a child being attacked (47%), and
6. Potential risk to myself in a face-to-face encounter (23%).

These responses suggest that while there is significant concern about coyotes in Mitchell County, only slightly more than half of survey respondents indicated that they were “very concerned” about any of the specific situations presented.

The highest level of concern was about coyotes spreading rabies. While coyotes can and do carry rabies, the incidence of rabies in coyotes is less than other mammals such as raccoon, fox, and skunk. In 2016 the North Carolina Rabies laboratory tested 3616 animals, 9 of those were coyotes and they all tested negative for the rabies virus.

The next highest rated concern was that coyotes were a regular presence near respondent’s farms (56%). When presented with response options ranging from 0 to 11+ times, thirty-nine (39%) of livestock owners indicated that they had heard a coyote 11+ times within roughly a mile of their farm in the last twelve months. Six percent (6%) of respondents indicated that they had not heard a coyote in the last twelve months. In addition, forty-three (43%) of owners indicated that they had seen a coyote between 2-5 times with 10% indicating they had not seen a coyote in the last twelve months. These results suggest that landowners are more likely to hear rather than see coyotes near their farm and that hearing coyotes is enough to create concern amongst respondents.

Eighty-two percent (82%) of livestock owners indicated they feel the coyote population has increased in the last 10 years. The need for education and outreach programs directed toward all citizens (not just livestock owners) about coyotes and how the established presence of coyotes affects them remains paramount in all management efforts.

Fifty percent (50%) of the survey respondents indicated that they believe coyotes were placed in the county by a government agency. This seems to be a common misconception, at no time did a government agency bring coyotes to Mitchell County or to the State of North Carolina. The need for education and outreach programs directed toward all citizens (including livestock owners) about coyote biology and their interaction with humans and domestic animals is the cornerstone of any coyote management efforts.

Livestock Ownership

The majority of livestock owners in Mitchell County responding to the survey own cattle followed by equine and poultry. Some respondents also included cats, dogs, and pigs in their responses. Numbers of producers and numbers of animals owned by livestock type are presented in the table 1.

Table 1: Respondent Livestock Ownership in Mitchell County

Livestock	Number of Producers	Minimum Animals	Maximum Animals	Sum	Mean
Cattle	35	2	80	979	28
Goats	6	2	60	87	15
Equine	14	1	6	35	3
Sheep	1	2	2	2	2
Poultry	10	10	50	279	28
Other species	4	2	4	10	3

Assessment of Damage to Private Property (specifically livestock) associated with coyotes.

Fifty-eight percent (58%) of survey respondents indicated that they had not lost any livestock to predators in the last three years and 42% indicated that they had lost livestock to predators in the last three years. Of the 55 respondents, eighteen indicated that they believed coyotes were responsible for the depredation that occurred on their livestock. Other predators reported to have killed livestock included bobcats (4%), feral dogs (13%), and black bears (13%). Seventeen percent (17%) indicated something other than the species provided in the survey killed their livestock (i.e. fox, owl, raccoon, etc.) and 13% indicated that they were not sure what killed their livestock.

Of the eighteen livestock producers that believed they had lost livestock to coyotes, the mean number of animals lost over three years were, poultry (10), cattle (2.19), and goats (1.5). The maximum number of cattle lost over a three-year period by any one owner was six.

Effectiveness of different coyote control methodologies.

While coyotes have established a reputation for efficient and effective predation in North Carolina, the extent of coyote predation on livestock is poorly documented. Identifying localized impacts of predation on livestock across North Carolina through additional research is critical to developing effective and efficient statewide damage control methodologies that are applicable at a local level.

Constituents attending the initial meeting in Mitchell County presented multiple recommendations for coyote population reduction, including the use of a bounty system. Historically, bounties have been used with little success to control coyote populations. The use of bounties for controlling unwanted wildlife, including predators, have largely been discontinued because they are ineffective in reducing actual damage and are not economically viable. For example, the North Carolina coyote harvest for 2014-15 totaled 51,118 animals. If each of those were reported for the purpose of collecting a bounty, the cost would exceed \$1.2 million annually at \$25 per animal for animals that are already being removed from the landscape. Additionally, killing individual coyotes that are not causing damage opens territories for other coyotes that may have learned to depredate livestock or cause other type of damage.

Lethal removal targeting offending coyotes can be a very effective method to reduce coyote damage. However, it is important to understand that indiscriminate removal of coyotes can be ineffective and counterproductive. Animal husbandry practice modification and non-lethal control techniques may prove more effective for reducing coyote depredations on livestock than lethal removal. Some of the very effective practices and techniques include: confining or concentrating young or birthing livestock at peak times of vulnerability, removing carrion from pastures, improved fencing, and the use of guard animals. Protective fencing options are available and can exclude or deter coyote depredation in an area. Dogs, donkeys, mules, and llamas are used as effective livestock guards to reduce property loss by coyotes.

To develop a better understanding of what actions Mitchell County livestock producers may have taken to address coyote issues, survey recipients were offered a list of different management actions that they have or have not employed to address coyote “problems” on their farm. The term “problem” was intentionally not defined, as mere coyote presence may be perceived as a problem for respondents that have never experience livestock loss.

The majority of respondents indicated they had not implement the actions presented in the survey. This might suggest that while respondents are concerned about coyotes, their concern and/or actual damage had not risen to a level at which a landowner decided to take action.

Alternatively, this could indicate that respondents were not aware of what actions could be taken.

Of those who did implement some type of management action, the top four were:

1. the livestock owner or family member fired a gun to scare it but not kill it (implemented/problem remained, 39%; implemented/problem solved, 8%),
2. removed outside attractants (e.g. pet food, garbage, etc.) (implemented/problem remained, 38%; implemented/problem solved, 8%), and
3. allowed someone to hunt coyotes on their property (implemented/problem remained, 35%; implemented /problem solved, 6%).
4. Placed a guard animal with my livestock (dog, donkey, llama, etc.) (implemented/problem remained, 31%, implemented/problem solved, 8%).

When non-lethal techniques do not deter depredations, targeted or selected removal of offending coyotes may achieve management objectives. Removing one or two offending individuals in a small area may stop the problem. Trapping is the most effective and efficient means for targeting and removing coyotes that are actively depredating livestock. However, trapping coyotes requires knowledge and a skillset not necessarily possessed by the average individual. Well trained and experienced coyote trappers are typically required to successfully remove problem animals without exacerbating the issue by causing the coyotes to become more difficult to trap due to poor technique.

The concept of a coyote management assistance program might include tools that connect qualified trappers with landowners to remove offending animals from private property. This strategy would require the landowners grant access to their property. It would also require a funding model to address trapping costs. To identify respondent support for certain options related to providing this type of service, respondents were asked about their level of acceptance of the following scenarios.

1. Government officials trapping coyotes on their property.
 - Sixty-five percent (65%) of livestock owners felt it was acceptable, 22% felt it was unacceptable.
2. Contracting with private trappers to trap and remove coyotes on their property.
 - Fifty-six percent (56%) of livestock owners felt it was acceptable, 34% felt it was unacceptable.
3. The County paying private contractors to trap coyotes on their property.
 - Sixty-three percent (63%) of livestock owners felt it was acceptable, 27% felt it was unacceptable.
4. The State paying private contractors to trap coyotes on their property.
 - Sixty-four percent (64%) of livestock owners felt it was acceptable,

23% felt it was unacceptable.

5. A cost share arrangement where the landowner, county and/or State share the cost of trapping coyotes on my property.
 - Twenty-nine percent (29%) of livestock owners felt it was acceptable, 49% felt it was unacceptable.

These results suggest the majority of respondents agree with the concept of allowing government officials and private trappers to trap and remove coyotes from their property provided that the State or County paid for those services (while 56% of respondents thought it was acceptable to contract with trappers – it is not clear who they thought should pay). Respondents were less likely to support a cost share model where the landowner, County and State shared the cost of those services. This is not unexpected given that many survey respondents believe that a government agency is responsible for the coyotes being introduced to Mitchell County. Nevertheless, 29% of respondents indicated that a cost-share model for providing trapping services on their land would be acceptable.

2. Provide public outreach related to coyote biology and coyote management;

NCWRC staff worked with Mitchell County Cooperative Extension and Mitchell county officials to design and implement an educational outreach strategy. Specifically, this effort includes informational packages made available at the County Extension office and structured workshops to educate livestock producers and other concerned citizens regarding coyote biology, management, and damage control options available.

NCWRC partnered with Mitchell County, USDA-Wildlife Services, and the North Carolina Trappers Association to conduct the first Coyote Damage Management Workshop in the State on May 17, 2016 (Appendix II). NCWRC and USDA-Wildlife Services staff presented information about the history and biology of coyotes, legal aspects of coyote management, options to control or minimize damage from coyotes, and how to examine animal carcasses for evidence of predation likely caused by coyotes. Participants were given a hands-on demonstration by a trapping expert regarding setting traps for the capture of coyotes with specific information and strategies related to trapping coyotes that appear to be preying on livestock.

In addition, attendees were given information about the availability of onsite technical guidance provided by NCWRC wildlife biologists. This service focuses on coyote biology and how to minimize predation using lethal and non-lethal control methods including alternative husbandry practices and is available to landowners throughout the state. Based on our interaction with individuals in Mitchell County, this resource is not well known.

Reviews and comments by the workshop attendees indicated that they very much appreciated the workshops. Attendees stated that they learned a considerable amount about coyotes and

coyote management, and developed a better understanding of coyote damage and options for addressing that damage.

The NCWRC replicated this workshop in two other locations (Statesville and Greenville) in 2016. Due to high demand, two workshops were held in Statesville. Livestock producers were well represented at the first Statesville workshop with the other two workshops having greater attendance by citizens with a general concern about coyotes and the potential impact on other wildlife species.

3. Develop a communication system to place landowners in direct contact with individuals qualified to assess and address coyote depredation.

NCWRC staff worked with the local Cooperative Extension office, landowners, and other livestock predation experts to develop a system that livestock producers can access to help them identify depredating animals based on examination of carcasses believed to have been lost due to predation. Because the emphasis should be on assisting producers with reduction in loss due to predation (regardless of the species of predator), identifying the cause of death and attempting to link that cause to a particular species will aid in determining the most effective treatment or management methodology.

This process is ongoing and will improve as coordination and cooperation between local Cooperative Extension Offices, livestock producers, NCWRC staff and other qualified animal damage experts improve through a county centered hub. Little damage/predation was reported during the pilot time period, as supported by the results of the survey, and we were unable to test the effectiveness of the communication system. However, the communication system is and will remain a valuable asset to document and quantify the real impacts of predation on our livestock producers.

4. Educate constituents on coyote management options and available coyote depredation management techniques.

There are currently a number of laws and regulations that provide options for citizens to address coyote depredation issues. Options are briefly outlined below.

Hunting

Coyote hunting is allowed year-round, both day and night, and with the aid of electronic calls in Mitchell County. Landowners may hunt coyotes on their property at any time without a hunting license or permit.

Trapping

Trapping coyotes is legal in Mitchell County during the established trapping season (November 1st – February 28th). However, complex county by county trapping laws for other species, specifically foxes, which are illegal to trap in Mitchell County, may lead to confusion regarding the legality of trapping coyotes in certain areas.

Depredation Shooting/Trapping

Landowners may shoot coyotes at any time on their property. In addition, landowners may obtain a depredation permit to shoot coyotes, either from Wildlife Damage Control Agents or from NCWRC staff when damage is documented - livestock and poultry owners may obtain a coyote depredation permit for shooting or trapping upon request, even if no damage has occurred. The depredation permit can specify other individuals (referred to as 2nd party shooters) who can shoot coyotes on their property. Individuals listed as second party shooters on a depredation permit are not legally required to have a hunting license. Depredation permits to shoot coyotes are not routinely requested in most rural areas since year round 24-hour hunting is already legal.

Mitchell County livestock owner's knowledge of coyote management options and available coyote depredation management techniques.

A portion of the survey inquired about livestock owner's knowledge of current regulations regarding take of coyotes. Only half (52%) of the livestock owners were confident that hunting coyotes was legal in Mitchell County and fewer (38%) believed trapping was legal. When asked about a landowner's right to shoot coyotes in the act of doing damage, 40% of the respondents indicated they were somewhat knowledgeable. When asked about an individual's lawful right to obtain a depredation permit to trap coyotes on their property, 62% of the respondents indicated that they were not at all knowledgeable about this option.

Results from the survey confirm a lack of knowledge and understanding of the currently available legal options for landowners to address coyote issues through animal removal. These results highlight the need to provide greater outreach and information material at the county level such that local residents and government officials clearly understand all the options available to them. Better communication regarding rules and regulations that govern coyote take may prove of great value for livestock owners.

Future Actions and Recommendations

Recognizing that coyotes cannot be extirpated from North Carolina's landscape, coyote damage complaints must be addressed on an incident specific basis. Based on survey results, individuals with concerns about coyotes appear to fit into one of two categories: people that have experienced loss or damage believed to be caused by coyotes; and people that are simply

concerned because they are aware coyotes are nearby (they occasionally see or hear them). While both groups had limited knowledge of the options available to address their concerns, only a few of those respondents with potential to lose livestock had taken either preventative or responsive action in Mitchell County. While trying to assess type of predators and their impacts on livestock, efforts were made to investigate potential depredation incidents during the pilot project; due to limited predatory activity, we were unable to test the effectiveness of this service. The structure and necessary components of this service remain in place to be used if predation takes place.

We recommend continuing the outreach started with this pilot program and to expand and enhance access to information related to coyote biology and management at the Cooperative Extension offices. Access to resource professionals and the myriad of options currently available to the private landowner must be appropriately communicated to improve user experience.

Mitchell and Yancey County Cooperative Extension partners involved in the pilot project indicated that printed material and/or easy access to online material that can be printed for constituents is a constructive step towards informing citizens about coyotes, coyote management and addressing coyote damage on their property.

We do not recommend funding a coyote removal program (i.e. bounties) due to the ineffectiveness of indiscriminate coyote removal in resolving depredation. In addition, the cost of such a program is not economically viable and would greatly exceed the economic losses currently being realized.

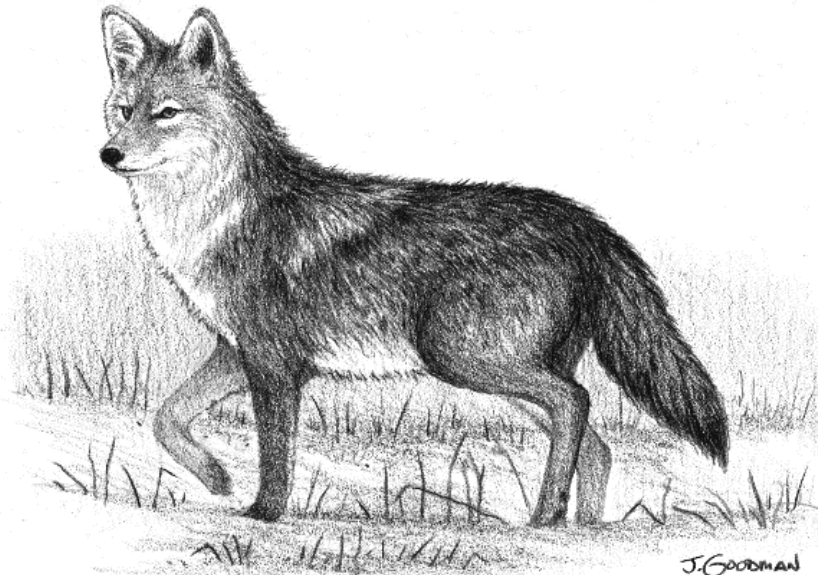
With the completion of this pilot project and the information obtained from both professional staff and the local landowners and livestock producers, the recommendation for specific actions that should be taken in Mitchell County and in other affected counties are:

1. Promote the local Cooperative Extension offices as a hub for local citizens to obtain information specifically related to coyote biology and management, and connect the citizens with appropriate professionals to address their needs.
2. Distribute and or make readily available all current coyote management and regulation educational materials produced by the NCWRC.
3. Develop a brochure that clearly outlines landowner's legal rights to address coyote depredation on their property.
4. Continue the Coyote Damage Management workshops targeting smaller geographic areas of the state (i.e. County level workshops) where possible and desired.
5. Ensure that landowners and other professionals are aware of and have access to the damage management assistance resources currently provided by NCWRC.
 - a. Licensed Trappers (<http://www.ncwildlife.org/Trapping/Contact-a-Licensed-Trapper>)
 - b. Wildlife Damage Control Agents (WDCA)
(<http://www.ncwildlife.org/Trapping/Wildlife-Damage-Control-Agent>)

- c. Professional assistance from NCWRC biologists upon request to any citizen in the State free of charge to examine their property and provide direction for managing coyotes and coyote depredation.
- 6. Continue to monitor constituent needs and develop recommendations to address evolving issues as appropriate.

APPENDIX 1. Survey Results for Mitchell and Yancey County Livestock Owners

Survey of Mitchell County Livestock Owners About Coyotes



N=55

We need your help to better understand the interactions between livestock owners and coyotes in Mitchell County, North Carolina.

You are receiving this survey because Mitchell County Agriculture Extension identified you as a livestock owner in the County.

Your answers are completely confidential and will be used to inform future management decisions.

This survey should take about 15 minutes to complete. Please complete the following questions and return it in the enclosed business reply envelope, or mail to:

N.C. Wildlife Resources Commission
1723 Mail Service Center
Raleigh, NC 27699-1700

1) In Mitchell County, how concerned are you that coyotes are on or near your farm?

Not at all Concerned		Somewhat Concerned		Extremely Concerned
0	1	2	3	4
1.9%	3.7%	16.7%	7.4%	70.4%

2) Within roughly a mile of your farm and in the last 12 months, how many times have you...
(Check one box in the row or answer "Don't know")

	0	1	Times 2-5	6-10	11+	Don't know
... heard a coyote?	5.6%	3.7%	16.7%	25.9%	38.9%	9.3%
... seen a coyote?	10.2%	16.3%	42.9%	12.2%	12.2%	6.1%

3) In your opinion, how has the coyote population in Mitchell County changed in the last ten years? (Check one)

81.8% Increased

7.3% Stayed the Same

3.6% Decreased

7.3% Unsure

4) How do you think coyotes got to North Carolina? (Check all that apply)

18.5% They walked here from other states

25.9% Unsure

24.1% They were released in NC by hunters

1.9% They have always been here

50.0% They were released by a government agency

3.7% Other (specify): Wildlife, Wildlife Commission

5) Is coyote hunting legal in Mitchell County? (Check one)

51.9% Yes

0% No

48.1% Unsure

- 6) Is coyote trapping legal in Mitchell County? (Check one)

38.2% Yes

0% No

61.8% Unsure

- 7) If you wanted more information about coyotes, what source would you go to first?

(Check one)

12.7% A friend or family member

30.9% Agriculture Extension

21.8% General web search

41.8% The NC Wildlife Resources Commission

1.8% Local animal control

3.6% Other (specify): No one to go to, there is no one to help

- 8) Please circle the number that best represents how knowledgeable you are about a livestock owner's ability to get a permit to trap coyotes.

Not at all knowledgeable		Somewhat knowledgeable		Extremely knowledgeable
0	1	2	3	4
61.8%	16.4%	21.8%	0%	0%

- 9) Please circle the number that best represents how knowledgeable you are about a landholders' (owners, farmers, etc.) right to shoot coyotes in the act of doing damage.

Not at all knowledgeable		Somewhat knowledgeable		Extremely knowledgeable
0	1	2	3	4
23.6%	10.9%	40.0%	9.1%	16.4%

- 10) What livestock are present on your farm? (Check all that apply and please estimate the average number of each type you have in a normal year)

74.5% Cattle (# 27.97 (Mean)) 3.6% Sheep (# 2.00 (Mean))

10.9% Goats (# 14.50 (Mean)) 27.3% Poultry (chickens, turkeys, ducks, etc.) (# 27.90, Mean))

27.3% Equine (horses, ponies, mules, donkeys, etc.) (# 2.50 (Mean))

16.4% Other Cats, dogs, pigs/hogs (2.50 (Mean))

14.5% None, I no longer have livestock

11) Have you lost livestock to predators in the last three years?

41.8% Yes

58.2% No

If you answered YES to Question 11, please proceed to Questions 12.

If you answered NO to Question 11, please skip to Question 14.

12) Which species do you believe is responsible for the loss of your livestock in the past 3 years? (Check all that apply)

4.3% Bobcat

13.0% Feral dogs

78.3% Coyote

13.0% Black bear

0% Black Vultures

17.4% Other (specify): fox, mountain lion/big cat, opossum, raccoon, owls

13.0% In some cases, I was unsure what killed the animal

13) If you checked coyotes in question 12, please indicate the numbers of animals of each species you feel you have lost to coyotes in the last 3 years.

2.19 (Mean) Cattle 0 Sheep 1.50 (Mean) Goats

10.00 (Mean) Poultry 0 Equine I did not lose animals to coyotes

1.00 (Mean) Other (please specify): _____

14) Based on your experience with coyotes, please rank your concerns for each of the following. (Check one box for each row)

	Not concerned Very Concerned				
	0	1	2	3	4
Regular presence of coyotes near your farm	9.3%	3.7%	13.0%	18.5%	55.6%
Potential risk to myself in a face-to-face encounter with a coyote	26.4%	18.9%	18.9%	13.2%	22.6%
A child being attacked	13.2%	9.4%	11.3%	18.9%	47.2%
A pet being attacked	9.6%	5.8%	13.5%	21.2%	50.0%

Damage to your property (livestock, crops)	9.6%	7.7%	9.6%	21.2%	51.9%
Coyotes spreading rabies	3.8%	3.8%	19.2%	15.4%	57.7%

15) Which of the following actions, if any, have you taken because a coyote was on your farm?

(Check one box for each row)

	Did not implement this action	Implemented action, but coyote problem remained	Implemented action, and coyote problem was solved
Removed outside attractants (e.g., pet food, garbage, etc.)	54.0%	38.0%	8.0%
Called a wildlife official	93.8%	6.3%	0%
Yelled at or tried to scare it	58.8%	33.3%	7.8%
You or a family member fired a gun to scare it, but not kill it	53.8%	38.5%	7.7%
Confined my livestock or pets	65.3%	24.5%	10.2%
Put up fencing to protect my animals	74.5%	17.6%	7.8%
Placed a guard animal with my livestock (dog, donkey, llama, etc.)	61.5%	30.8%	7.7%
Trapped it myself	94.2%	5.8%	0%
Someone trapped it for me for free	94.1%	5.9%	0%
I paid a person to trap it	96.1%	3.9%	0%
I hired a Wildlife Damage Control Agent	100.0%	0%	0%
I or a family member shot it	71.4%	26.5%	2.0%

Allowed someone to hunt coyotes on my property	59.6%	34.6%	5.8%
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 16) For the following scenarios, please indicate the acceptability or unacceptability of each of the following options for removing coyotes from your property.

(Check one box for each row)

Coyote Removal Methods	<div> <div>Highly Unacceptable</div> <div>Highly Acceptable</div> </div>				
	0	1	2	3	4
Government officials trapping coyotes on my property would be...	17.6%	3.9%	13.7%	5.9%	58.8%
Contracting with private trappers to trap and remove coyotes on my property would be ...	28.0%	6.0%	10.0%	14.0%	42.0%
The County paying private contractors to trap coyotes on my property would be...	23.5%	3.9%	9.8%	9.8%	52.9%
The State paying private contractors to trap coyotes on my property would be ...	21.2%	1.9%	13.5%	7.7%	55.8%
A cost share arrangement where the landowner, county and/or State share the cost of trapping coyotes on my property would be ...	33.3%	15.7%	21.6%	7.8%	21.6%

DEMOGRAPHICS: (For statistical purposes only. Your responses are confidential).

- 17) How many years have you lived in Mitchell County? 61.20 (Mean) years

- 18) In what year were you born? 67.02 (Mean Age)

- 19) Are you male or female?
92.6% Male 7.4% Female

20) Which of the following best represents your gross household income (before taxes) in 2015?
(Check one)

- 8.5% Less than \$20,000
- 27.7% \$20,000-39,999
- 10.6% \$40,000-59,999
- 21.3% \$60,000-79,999
- 8.5% \$80,000-100,000
- 8.5% \$100,000-120,000
- 8.5% More than \$120,000
- 6.4% Prefer not to answer

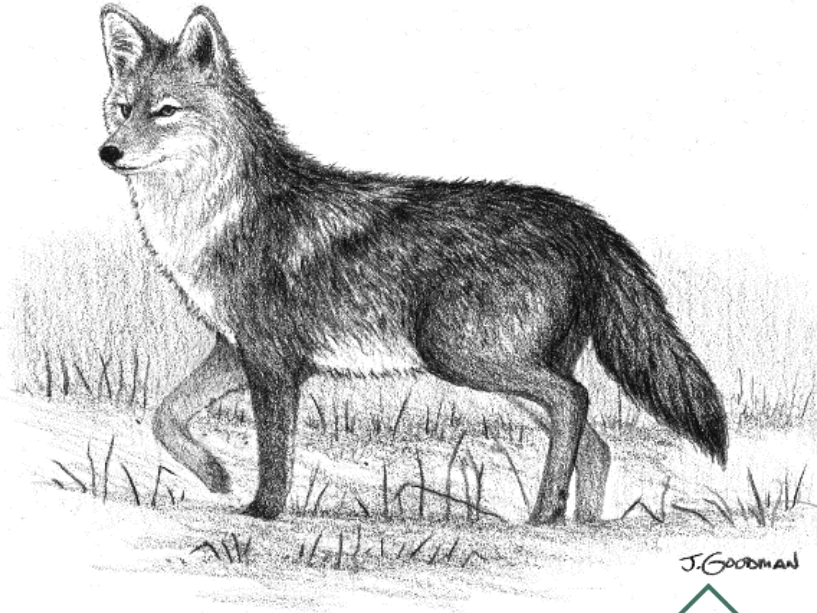
21) What is the highest level of schooling/education that you have completed? (Check one)

- 7.7% Less than a high school education
- 28.8% High school or GED
- 9.6% Vocational, technical, trade school or certificate program
- 13.5% Some college course work (no degree)
- 7.7% Associate's degree (2 year degree)
- 19.2% Bachelor's degree (4 year degree)
- 3.8% Some graduate study
- 7.7% Graduate or professional degree
- 1.9% Other- Please specify Hands-on experience

CONTACT PHONE NUMBERS

Survey Information	828-294-2605
License Information and Purchasing.....	888-248-6834
Violations Reporting	800-662-7137
NC Turn-In-Poachers.....	855-945-3847 (1-855-WILDTIP)
Hunter Safety Course Information.....	919-707-0031
Enforcement Operations.....	919-707-0030
Engineering and Land Management	919-707-0150
Wildlife Management.....	919-707-0050

**Survey of Yancey County
Livestock Owners
About Coyotes**



N=26

We need your help to better understand the interactions between livestock owners and coyotes in Mitchell County, North Carolina.

You are receiving this survey because Mitchell County Agriculture Extension identified you as a livestock owner in the County.

Your answers are completely confidential and will be used to inform future management decisions.

This survey should take about 15 minutes to complete. Please complete the following questions and return it in the enclosed business reply envelope, or mail to:

N.C. Wildlife Resources Commission
1723 Mail Service Center
Raleigh, NC 27699-1700

Thank you!

1) In Yancey County, how concerned are you that coyotes are on or near your farm?

Not at all Concerned		Somewhat Concerned		Extremely Concerned
0	1	2	3	4
0%	0%	16.0%	24.0%	60.0%

2) Within roughly a mile of your farm and in the last 12 months, how many times have you...
(Check one box in the row or answer "Don't know")

	0	1	Times 2-5	6-10	11+	Don't know
... heard a coyote?	0%	0%	0%	28.0%	72.0%	0%
... seen a coyote?	8.0%	16.0%	32.0%	28.0%	16.0%	0%

3) In your opinion, how has the coyote population in Yancey County changed in the last ten years?
(Check one)

92.0% Increased
4.0% Stayed the Same
4.0% Decreased
0% Unsure

4) How do you think coyotes got to North Carolina? (Check all that apply)

32.0% They walked here from other states 8.0% Unsure
48.0% They were released in NC by hunters 4.0% They have always been here
60.0% They were released by a government agency
8.0% Other (specify): Fox hunters; I hear rumors of them being released in fox pens and escaping – they say they run better than a fox when run with hounds

5) Is coyote hunting legal in Yancey County? (Check one)

76.0% Yes
4.0% No
20.0% Unsure

6) Is coyote trapping legal in Yancey County? (Check one)

68.0% Yes

4.0% No

28.0% Unsure

7) If you wanted more information about coyotes, what source would you go to first?

(Check one)

8.0% A friend or family member

16.0% Agriculture Extension

20.0% General web search

64.0% The NC Wildlife Resources Commission

0% Local animal control

0% Other (specify): _____

8) Please circle the number that best represents how knowledgeable you are about a livestock owner's ability to get a permit to trap coyotes.

Not at all knowledgeable		Somewhat knowledgeable		Extremely knowledgeable
0	1	2	3	4
50.0%	4.5%	18.2%	18.2%	9.1%

9) Please circle the number that best represents how knowledgeable you are about a landholders' (owners, farmers, etc.) right to shoot coyotes in the act of doing damage.

Not at all knowledgeable		Somewhat knowledgeable		Extremely knowledgeable
0	1	2	3	4
13.0%	13.0%	21.7%	8.7%	43.5%

10) What livestock are present on your farm? (Check all that apply and please estimate the average number of each type you have in a normal year)

84.0% Cattle (# 32.20 (Mean)) 16.0% Sheep (# 6.25 (Mean))

12.0% Goats (# 13.00 (Mean)) 32.0% Poultry (chickens, turkeys, ducks, etc.) (# 29.13 (Mean))

24.0% Equine (horses, ponies, mules, donkeys, etc.) (# 4.00 (Mean))

0% Other _____

8.0% None, I no longer have livestock

- 11) Have you lost livestock to predators in the last three years?
50.0% Yes 50.0% No

If you answered YES to Question 11, please proceed to Questions 12.

If you answered NO to Question 11, please skip to Question 14.

- 12) Which species do you believe is responsible for the loss of your livestock in the past 3 years? (Check all that apply)

7.7% Bobcat 7.0% Feral dogs 84.6% Coyote

30.8% Black bear 0% Black Vultures

7.7% Other (specify): fox

15.4% In some cases, I was unsure what killed the animal

- 13) If you checked coyotes in question 12, please indicate the numbers of animals of each species you feel you have lost to coyotes in the last 3 years.

3.20 (Mean) Cattle 0 Sheep 10.00 (Mean) Goats

10.00 (Mean) Poultry 0 Equine I did not lose animals to coyotes

0 Other (please specify): _____

- 14) Based on your experience with coyotes, please rank your concerns for each of the following. (Check one box for each row)

	<div> <div>Not concerned</div> <div>Very Concerned</div> </div>				
	0	1	2	3	4
Regular presence of coyotes near your farm	3.8%	0%	3.8%	38.5%	53.8%
Potential risk to myself in a face-to-face encounter with a coyote	11.5%	23.1%	30.8%	19.2%	15.4%
A child being attacked	3.8%	7.7%	15.4%	26.9%	46.2%
A pet being attacked	0%	0%	28.0%	36.0%	36.0%
Damage to your property (livestock, crops)	3.8%	7.7%	3.8%	26.9%	57.7%
Coyotes spreading rabies	3.8%	3.8%	3.8%	23.1%	65.4%

15) Which of the following actions, if any, have you taken because a coyote was on your farm?

(Check one box for each row)

	Did not implement this action	Implemented action, but coyote problem remained	Implemented action, and coyote problem was solved
Removed outside attractants (e.g., pet food, garbage, etc.)	52.2%	47.8%	0%
Called a wildlife official	95.7%	4.3%	0%
Yelled at or tried to scare it	52.4%	47.6%	0%
You or a family member fired a gun to scare it, but not kill it	45.8%	45.8%	8.3%
Confined my livestock or pets	66.7%	20.8%	12.5%
Put up fencing to protect my animals	66.7%	25.0%	8.3%
Placed a guard animal with my livestock (dog, donkey, llama, etc.)	79.2%	8.3%	12.5%
Trapped it myself	69.6%	26.1%	4.3%
Someone trapped it for me for free	91.3%	8.7%	0%
I paid a person to trap it	100.0%	0%	0%
I hired a Wildlife Damage Control Agent	100.0%	0%	0%
I or a family member shot it	43.5%	43.5%	13.0%
Allowed someone to hunt coyotes on my property	62.5%	29.2%	8.3%
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16) For the following scenarios, please indicate the acceptability or unacceptability of each of the following options for removing coyotes from your property.

(Check one box for each row)

Coyote Removal Methods	<div> <div>Highly Unacceptable</div> <div>Highly Acceptable</div> <div> <div>←</div> <div>→</div> </div> </div>				
	0	1	2	3	4
Government officials trapping coyotes on my property would be...	23.1%	3.8%	15.4%	11.5%	46.2%
Contracting with private trappers to trap and remove coyotes on my property would be ...	34.6%	11.5%	26.9%	7.7%	19.2%
The County paying private contractors to trap coyotes on my property would be...	34.6%	11.5%	11.5%	7.7%	34.6%
The State paying private contractors to trap coyotes on my property would be ...	34.6%	11.5%	7.7%	7.7%	38.5%
A cost share arrangement where the landowner, county and/or State share the cost of trapping coyotes on my property would be ...	61.5%	7.7%	11.5%	0%	19.2%

DEMOGRAPHICS: (For statistical purposes only. Your responses are confidential).

17) How many years have you lived in Yancey County? 55.38 (Mean) years

18) In what year were you born? 61.81 (Mean Age)

19) Are you male or female?

100.0% Male 0% Female

20) Which of the following best represents your gross household income (before taxes) in 2015?
(Check one)

- 13.6% Less than \$20,000
- 22.7% \$20,000-39,999
- 31.8% \$40,000-59,999
- 9.1% \$60,000-79,999
- 0% \$80,000-100,000
- 4.5% \$100,000-120,000
- 13.6% More than \$120,000
- 4.5% Prefer not to answer

21) What is the highest level of schooling/education that you have completed? (Check one)

- 3.8% Less than a high school education
- 23.1% High school or GED
- 15.4% Vocational, technical, trade school or certificate program
- 11.5% Some college course work (no degree)
- 7.7% Associate's degree (2 year degree)
- 30.8% Bachelor's degree (4 year degree)
- 3.8% Some graduate study
- 3.8% Graduate or professional degree
- 0% Other- Please specify_____

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Engineering and Land Management	919-707-0150
Wildlife Management.....	919-707-0050

Coyote Conflict Management Workshop

Tuesday, May 17th, 2016

5:45 pm to 9:00 pm

Learn about:

- Coyote biology and population;
- Trapping techniques to address problem coyotes;
- Practical non-lethal methods to prevent /reduce coyote conflicts
- Laws and regulations on taking coyotes.

Who Should Attend?

Anyone interested in learning about the tools available to remove problem coyotes from their property, as well as the non-lethal methods that can be effectively used to prevent conflicts.

Workshop Location

Mitchell County Historic Courthouse
11 N Mitchell Ave.
Bakersville, NC 28705

Costs: \$10 per person

To register:

Call Mitchell County Extension Center -
(828) 688-4811

Agenda

5:45 pm	Registration
6:00 pm	Coyote Biology
6:30 pm	Non-lethal Techniques
6:45 pm	Coyote Trapping Techniques & Safety Consideration
7:15pm	Coyote Trapping Regulations
7:30pm	Break
7:45pm	Coyote Trapping Techniques & Demonstrations
9:00pm	Q & A / adjourn

Register early; workshop limited to 50 people



Protecting People | Protecting Agriculture | Protecting Wildlife



