March 1st, 2018

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

Representative Chuck McGrady
N.C. House of Representatives
300 N. Salisbury Street, Room 304
Raleigh, NC 27603-5925

Senator Trudy Wade
N.C. Senate
300 N. Salisbury Street, Room 521
Raleigh, NC 27603-5925

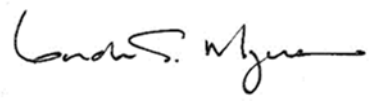
Members:

The 2015 General Assembly directed the North Carolina Wildlife Resources Commission to establish a coyote management plan to address the impacts of coyotes in North Carolina. The North Carolina Wildlife Resources Commission adopted the Coyote Management Plan on February 28, 2018.

In addition to approving the plan, the Commission charged its Executive Director to: "Initiate and enable a process through which stakeholders can identify concerns regarding the management of foxes and coyotes in North Carolina with a goal to develop consensus on recommendations including regulatory and statutory approaches to improve the management of foxes and coyotes in North Carolina. Stakeholders should include relevant agencies, organizations, and constituents, including hunters, trappers, Controlled Fox Hunting Preserve operators, and non-profit organizations focused on conservation/wildlife/agriculture."

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
North Carolina Wildlife Resources Commission

Coyote Management Plan

March 1, 2018

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

Melissa McGaw/NCWRC

Prepared and submitted by the North Carolina Wildlife Resources Commission

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NORTH CAROLINA WILDLIFE RESOURCES COMMISSION
GORDON S. MYERS, EXECUTIVE DIRECTOR
1701 MAIL SERVICE CENTER, RALEIGH, N.C. 27699-1701

Coyote (photo: Alan Cameron)

Front cover photos: Top from left to right: National Park Service, Jeannie McEachern, U.S. Fish and Wildlife Service

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Introduction

The North Carolina Wildlife Resources Commission (Commission) 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. Through the development and implementation of wildlife management plans, the Commission merges the ecological needs of the State's wildlife resources with the desires of the citizens of the State.

Section 4.35. (a) of SL 2015-286, stipulates that "[t]he Wildlife Resources Commission shall establish a coyote management plan to address the impacts of coyotes in this State and the threats that coyotes pose to citizens, industries, and populations of native wildlife species within the State." In the Commission's 2016 Report to the Environmental Management Commission (Appendix A), Commission staff committed to developing a coyote management plan (Plan) by March 1, 2018. The development of a statewide management plan for any species is a complex undertaking that considers biological, social, economic, and political aspects of species management. Using the Commission's current coyote management efforts as a foundation, this Plan incorporates the current understanding of the attitudes, perceptions, and opinions of our citizens regarding coyotes, the available scientific information about coyotes, and the management strategies available to the Commission to address the above directive.

Coyotes are now a statewide component of North Carolina's fauna. County, regional, and statewide efforts at coyote management must recognize that the coyote is a persistent species and strategies must remain flexible and adaptive to address a wide array of issues and concerns. The Plan must satisfy the desires of North Carolinians by providing strategies and solutions capable of resolving and minimizing negative human-coyote interactions and other wildlife concerns.

Coyotes are found in all 100 counties of North Carolina.
(Photo: Wikimedia)

Herein, we identify concerns about coyotes, discuss the challenges of coyote control, and provide strategies to minimize potential impacts of coyotes. We provide recommendations for statutory changes that will improve coyote management. Finally, we identify known knowledge gaps and research needs and discuss new strategies for coyote management in North Carolina.

The Plan was developed by Commission staff based on best-available science and management principles, with incorporation of public comments from constituents, deer hunter surveys, and organizations across North Carolina. In addition, the Commission, in collaboration with North Carolina State University, conducted surveys of North Carolina citizens to ascertain the public's views and experiences regarding coyotes in 2015 (Drake 2016). Results from the surveys were reviewed by the Commission and incorporated into the Plan. A draft of the Plan was posted on the Commission's website (www.ncwildlife.org) from January 5 through February 9, 2018 to solicit public comments. Comments on the plan were reviewed by staff and incorporated as appropriate in this final version. The document was endorsed by a majority vote of the full Commission at its meeting on Wednesday, February 28, 2018.

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I. Coyote Range Expansion and Colonization of North Carolina

Prior to the 1800s, coyotes occupied the prairies and grasslands of the Midwest. Reduced competition through removal of other large predators (wolves and cougars), major landscape level habitat changes, including the creation of fields, trails and roads, and an increase of novel food resources such as crops allowed the expansion of coyotes across the United States. Contrary to the widespread cultural myth, the Commission did not release coyotes into North Carolina.

Coyotes took two paths to colonize the eastern United States (Figure 1, Appendix B). The northeastern path saw coyotes that had moved into the upper Midwest in the late 1800s, further expand into Canada during the early 1900s, New York and New England by the 1950s, and Pennsylvania and West Virginia in the mid-1970s (Moore and Parker 1992). The southeastern path documented coyotes in Arkansas by the 1920s, Alabama, Louisiana, Mississippi, and Tennessee by the mid-1960s, and Georgia, Florida, Kentucky, Maryland, North Carolina, and South Carolina by the mid- to late-1980s (Moore and Parker 1992; Mastro 2011). In southeastern states, evidence shows natural range expansion by coyotes was supplemented by illegal importations for hunting purposes (Hill et al. 1987).

Figure 1. Coyote Expansion throughout the United States.
Credit: http://science.sciencemag.org/content/341/6152/1332.full

The first coyotes believed to have naturally dispersed into North Carolina were detected in 1988 in the far western counties; elsewhere occurrences of coyotes were sporadic, and are suspected to be animals that either escaped from captivity or were released illegally for hunting. Coyotes colonized and expanded their range throughout North Carolina over the next decade (Appendix B). By 2005, natural range expansion coupled with illegal releases resulted in coyotes occurring in all North Carolina counties.

II. Concerns about Coyotes

Concerns regarding coyotes are multifaceted, ranging from an innate fear of predators and the belief that they are lurking to attack people to concerns that they kill animals that are important to us, both domestic and wild. The remedies, solutions, and actions that can be taken to address these concerns vary. Some concerns have options that can be applied to treat or resolve the problem, some may require an increased awareness and understanding of coyotes, others may simply require an acceptance that the desired outcome cannot be achieved. Successfully addressing concerns about coyotes requires an understanding of the types and levels of people's concerns. As with many wildlife issues, fears and concerns may be more closely linked to perceived dangers or potential damage rather than specific experiences or examples of either. To better address the concerns of North Carolina citizens regarding coyotes, a baseline understanding of the human component of this issue is required and specific concerns must be identified.

Survey Information from North Carolina

Citizen Survey: In 2014, urban/suburban residents, including hunters, in four metropolitan areas (Raleigh/Durham, Asheville, Charlotte, and Greenville), hunters residing in rural areas, and greenway users were surveyed on their knowledge and perception of coyotes (Drake et al. 2017). Knowledge of coyotes, including how they arrived in North Carolina and their biology, was generally low among all respondents. Perceptions about coyotes also differed by city of residence, gender, college education, hometown size, and pet ownership. Asheville residents were less fearful of coyotes than other areas; residents in Greenville had the lowest support for coyotes; and those of Charlotte perceived the most risk from coyotes (Drake 2016). Most urban respondents (62%) and hunters (57%) agreed with the statement "by following simple precautions, problems with coyotes can be avoided" (Drake et al. 2017).

The general public appears to be largely unfamiliar with why coyotes are in North Carolina (79%) and unaware of hunting and trapping seasons (88% and 92%, respectively). Even hunters are unaware of hunting and trapping seasons; 51% and 36% of hunters residing in urban/suburban areas and rural areas, respectively, were unsure about the coyote hunting season. Seventy-six percent and 57% of hunters residing in urban/suburban areas and rural areas, respectively, were unsure or unaware of the regulated trapping season.

Urban residents have generally neutral or negative views of coyotes in their cities, with 36% of urban respondents reporting that they do not like coyotes and 26% reporting that they do like coyotes. An equal percent of the public wanted the coyote population to either increase or stay the same (38%), or decrease or disappear completely (38%) in the next ten years. Greenway users and urban residents were more supportive of coyotes increasing or staying the same (38% to 48%) versus hunters (14% to 22%)

The public was generally not concerned about risk posed by coyotes; for example, perceived risk of a face-to-face encounter with a coyote was 0.7 on a 0-4 scale. Direct encounters with coyotes were rare, with a minority of respondents reporting they had heard a coyote (23%), observed a coyote (24%), felt threatened by a coyote (2%), or had a pet attacked by a coyote (4%). Few residents (9%) have ever taken action because of coyotes in their neighborhood and the most commonly implemented actions were keeping pets indoors (68%) or supervising outdoor pets (48%). A plurality of respondents who took these two actions reported that this solved their coyote problem. Urban residents preferred hazing of non-threatening coyotes (37% acceptable) as a management action over shooting (20% acceptable) or ignoring coyotes (32% acceptable).

On average, respondents reported the acceptability of state officials shooting coyotes as a management action to be 2.8 on a five-point scale, while the acceptability of trapping and euthanizing coyotes was 3.0. Most respondents (52%) reported that they would use a general web search to find out more information about coyotes while 31% stated that they would contact the Commission. However, most respondents (53%) reported they would call a wildlife official if they saw a coyote, and many respondents reported that they would take recommended actions, such as keeping pets inside (54%) and removing outdoor attractants (39%).

Consistent patterns in coyote perceptions were noted relating to respondent participation in hunting, greenway use, and city of residence. Among urban respondents, hunters had 0.31 lower support (on a 1-5 scale) for the presence of coyotes within cities and 1.50 higher support for lethal coyote management than the general population. Conversely, greenway users had 0.45 higher support for coyotes in urban areas than others surveyed.

As predicted by Ericsson & Heberlein (2003), hunters have less support for coyotes and are more accepting of lethal control methods than others surveyed. However, the hunting community is far from homogenous. Support for coyotes on the landscape by hunters varied by both location and most common prey species of the hunter, with deer and turkey hunters emerging as having the least support for coyotes (Drake et al. 2017). Hunters residing in suburban/urban areas generally agreed and held a higher belief that coyotes were an important part of nature in rural areas (3.09 on a five-point scale) than hunters residing in rural areas, who were neutral (2.56 on a five-point scale) on this statement. Greenway users generally had more positive perceptions of coyotes than others surveyed, suggesting that participation in non-consumptive outdoor activities relates to acceptance of coyotes on the landscape.

Livestock Owner Survey: During 2016, the Commission surveyed livestock owners in Mitchell and Yancey counties about coyotes (Appendix C). In Mitchell County, 70% of livestock owners were "extremely concerned" with coyotes on or near their farm and in Yancey County, 60% were "extremely concerned." Over half of those surveyed in each county believe that coyotes were released by a government agency, which is untrue and suggests misinformation about coyotes is common (Commission unpublished data). Further suggesting a lack of information, 48% of Mitchell County livestock owners were unsure if coyote hunting was legal and 62% were unsure if trapping was legal. These numbers were lower in Yancey County, with 20% being unsure about hunting and 28% being unsure about trapping. Less than 11% and 14% of Mitchell and Yancey county respondents, respectively, took any action to address their concerns about coyotes. The most common actions taken in Yancey County were shooting a coyote (13%), confining livestock (12.5%), or getting guard animals (12.5%), while confining livestock (10.2%) was the most common action in Mitchell County.

Common Concerns Regarding Coyotes

Coyotes in Proximity to People: A common complaint about coyotes is simply their presence on the landscape, particularly when they are in and around human infrastructure. In a rapidly developing state like North Carolina, coyotes and humans are likely to interact, and human behaviors and practices can greatly increase the likelihood of human-coyote interactions. Coyotes can become habituated to humans over time when they experience no negative consequences to interactions with people or when they learn to closely associate people and food through intentional or unintentional feeding (Timm et. al. 2004, Schmidt and Timm 2007, Bonnell and Breck 2017). Habituation can cause coyotes to lose their natural wariness of humans and become bold and potentially aggressive. Concerns about the presence of coyotes in an area can often be addressed by removing any potential food or habitat attractants that encourage coyotes to spend time in and around human infrastructure (Murray and St. Clair 2017).

Concern for the safety of humans is often expressed by citizens regarding coyotes. To date, there have been no documented attacks on humans by non-rabid coyotes in North Carolina.

Human Safety: Concern for the safety of humans is often expressed by citizens regarding coyotes. Coyotes behaving normally are curious but wary when close to humans, however habituation can lead to coyotes that are bold and aggressive. Any attack on humans by a canid, whether domestic or wild, is a serious concern. To date, there have been no documented attacks on humans by non-rabid coyotes in North Carolina.

In a recent review of coyote attacks on humans from 1970-2015, Baker and Timm (2017) documented 367 attacks by non-rabid coyotes in the United States and Canada, two of which were fatal. In comparison, 4.5 million dog bites occur nationwide annually, with 800,000 requiring medical attention; in 2016, 31 dog bites resulted in fatalities. North Carolina ranks 14th in dog bite incidences, with 77 dog bite claims to insurance companies in 2016 (Bennett 2017).

Most coyote attacks on humans have occurred in California and other urbanized areas in western states. Factors that contribute to increasingly bold behavior in coyotes are a resource-rich suburban environment, lack of harassment and hazing, and intentional feeding (Howell 1982, Carbyn 1989). Due to the adaptability of coyotes, it is possible for urban coyotes to become habituated to humans through the feeding of coyotes by a few residents within a neighborhood, defeating any efforts to keep urban coyotes wild (Schmidt and Timm 2007). In situations such as these, a more active approach, such as hazing (the application of deliberate negative conditioning), may be necessary. Hazing includes such actions as making loud noises, using your arms to make yourself look large, and, if needed, throwing small objects such as rocks or tennis balls directly at the coyote. In the short-term, hazing can encourage coyotes to move out of the immediate area, allowing the human to safely leave as well. Long-term behavioral changes associated with hazing have not been well studied, but anecdotal evidence supports hazing as a smart strategy in conjunction with the removal of food attractants. Research has shown that engaging citizens in community-level hazing efforts promotes greater understanding of coyotes and capacity to manage human-coyote interactions (Adams 2014, Bonnell and Breck 2017).

Hazing has not shown to be effective at reducing extreme aggressive behavior in problem coyotes, and these individuals are most effectively managed through targeted lethal removal (Baker 2007, Baker and Timm 2017, Breck et. al. 2017). Non-rabid coyotes exhibit an escalation in bold behaviors over time, allowing corrective measures to be implemented, such as hazing and removing anthropogenic attractants, that can reverse the behavior and avoid a dangerous situation.

While the statistical probability of a coyote attack is low and most certainly significantly less than that of a domestic dog, there are certain actions and behaviors that can minimize the threat of a coyote attack even further. To minimize negative human/coyote encounters the Commission routinely provides the following general advice.

- Do not approach a coyote. Remain a safe and respectful distance from the animal.
- Always supervise small children when outdoors, and remind them not to approach coyotes or other animals.
- Don't be intimidated by a coyote. Make noise and let the coyote know that it is not welcome near you. Throwing small objects such as rocks or tennis balls can encourage the animal to leave the area.
- Avoid areas where coyotes have dens and/or young. Coyotes will defend their pups, especially against domestic dogs, if you come too close.
- If you encounter an extremely aggressive or sick coyote (stumbling, listless, drooling excessively) contact your local Animal Control for immediate assistance. Coyotes can contract diseases such as rabies and canine distemper. Commission staff work cooperatively with citizens and other government agencies to address situations where lethal removal is required.

Pet Safety: In addition to concerns for human safety, concerns for pet safety are often raised by citizens. Few data are available on how many domestic cats and dogs are injured or killed by coyotes each year, but public perception is that these events are on the rise. Securing domestic pets indoors and supervising them when outdoors are simple, cost effective solutions that greatly reduce the risk of injury by a coyote.

Fencing can be used to exclude coyotes from yards; however, inadequate fences may not fully protect pets that are unsupervised in the yard. Fencing should be a minimum of 5.5 feet tall to limit coyotes climbing over and include either 2 feet of buried fence or apron fencing on the ground to prevent coyotes from digging under (Green et al. 1994). Existing fences can be modified with electricity or "coyote roller" devices to make them more challenging for coyotes. Fencing is most effective when used in conjunction with removal of food sources within the fenced area and proper supervision of pets.

Cats: Coyotes are predators that will opportunistically take cats as prey items when they are available and easy to capture. Outdoor cats are at risk of being killed by a coyote, as well as being exposed to other risk factors including other predators, dogs, cars, and diseases. Keeping cats indoors is a simple solution that eliminates the risk of coyotes injuring or killing a cat (Grubbs and Krausman, 2008).

Keeping cats indoors at all times eliminates the possibility of coyote depredation.
(Photo: Wikimedia)

Outdoor cats, and especially feral cat colonies, attract coyotes due to the number of cats in the area and the availability of food placed by humans. This may increase the visitation of coyotes to those areas resulting in other issues in the neighborhood.

Dogs: Like cats, small dogs can be viewed as potential prey items by coyotes, so supervision when outdoors is recommended, particularly at night. Attacks on large dogs are less common but can result from coyotes that view large dogs as competitors. Potential for coyote conflicts with large dogs increases during coyote breeding season (January to March) when coyotes are more likely to defend their territory. Supervising all dogs when they are outdoors, particularly at night, will reduce or eliminate the risk to dogs from coyotes.

Livestock Concerns: Livestock can be vulnerable to attacks by coyotes, resulting in loss of animals and economic impacts to producers. The US Department of Agriculture National Agriculture Statistics Service (NASS) keeps records on a range of aspects related to crop and livestock, including depredation on livestock. While these surveys are of producers on causes of mortality of their livestock, no verification is conducted to confirm suspected causes of mortality, and it is difficult to differentiate cause of mortality by an untrained person. For example, many predators, including coyotes, will scavenge a carcass, which is often confused with predation (Gese et al. 2005). In 2014, 6% of adult sheep loss and 4% of lamb loss was suspected to be due to predators (i.e., dogs, foxes, coyotes, vultures; NASS 2015). The number of adults and lambs lost due to suspected predators declined from 1995 through 2014, partly due to an increase in the use of nonlethal methods by livestock producers (NASS 2015). In the Southeast through 2009, NASS listed domestic dogs, followed by coyotes, as the top two suspected predators of sheep and goats, (NASS 2010). During 2010, domestic dogs and coyotes were suspected to be the top predators of cattle; suspected coyote predation comprised 3% of all cattle deaths (NASS 2011).

A variety of lethal and nonlethal tools have been documented to be effective at the prevention and management of livestock depredation (Appendix D; Green et. al. 1994, USDA 2002, Mitchell et al. 2004, Shivik 2004).

Game Species Concerns: Coyote impacts to game species is an often-raised concern from hunters and landowners. In their historic range, coyotes play an important ecological role in nature as an apex predator. In their new range, coyotes are filling the niche left vacant by large mammalian predators (i.e., wolves, cougars) that have been extirpated. It is important to remember that predation is a natural, normally occurring process in nature and that prey species develop physiological and morphological adaptations to offset predation risk and impact. While the arrival of coyotes in the eastern landscape is generally viewed negatively, there are some ecological and human benefits resulting from their presence. For example, coyotes can have positive impacts on ground nesting birds (e.g., waterfowl, quail), by preying on nest predators (e.g., foxes, raccoons and opossums; Sovada et al. 1995). Additionally, coyotes can benefit landowners by reducing numbers of undesirable species such as groundhogs and rodents.

The relationships between coyotes and prey species vary greatly. Human concerns most frequently involve both real and perceived issues surrounding coyote predation on game species such as white-tailed deer and game birds (e.g., quail and wild turkey). These concerns likely derive from the belief that predators are taking a resource that they perceive is reserved primarily for humans. In the case of coyotes, the predator is a recent arrival on our landscape, therefore sportsmen are reluctant to accept that resource allocation may be changing.

White-tailed Deer: Many deer hunters believe predators like coyotes are the biggest threat to NC's deer population (Figures 2 and 3, page 12), and likely believe coyotes are a substantial contributing factor for observed declines in deer numbers in parts of the state (Commission 2016). Numerous studies in the southeastern US have documented fawn predation by coyotes, and several indicate coyotes can have notable impacts on fawn survival and their recruitment into adulthood (Saalfeld and Ditchkoff 2007, Kilgo et al. 2012, Chitwood 2014, Gulsby et al. 2015). There are many factors that influence the effect coyotes have on fawn survivorship, including coyote density, deer density, abundance of alternative coyote food sources (e.g., small mammals and fruits), presence of other predator species, vegetative hiding cover for fawns, and habitat quality (Kilgo et al. 2012, Gulsby et al. 2017, Shuman et al. 2017). Intensive coyote trapping efforts have variable results and coyote impacts on fawn recruitment can vary seasonally, annually (Kilgo et al. 2014), and from one site to the next (Gulsby et al. 2015). Predator-prey relationships are extremely complex, and how this relationship plays into the intricacies of deer management and population trajectories is multifaceted (Ballard 2011) and remains poorly understood.

There are many factors that influence the effect coyotes have on fawn survivorship, including coyote density, deer density, abundance of alternative coyote food sources, presence of other predator species, vegetative hiding cover for fawns, and habitat quality.

Deer fawns may be preyed upon by numerous predators. In some studies, predation by bobcats and black bears rivals or exceeds that of coyotes (Vreeland et al. 2004, Shuman et al. 2017). However, most studies in the southeastern US indicate coyotes are the most common predator of fawns (Saalfeld and Ditchkoff 2007, Kilgo et al. 2012, Chitwood 2014, Gulsby et al. 2015). Coyotes can impact fawn recruitment to varying degrees, but the specific role coyotes play in herd dynamics across the landscape is complex and difficult to measure (Ballard 2011).

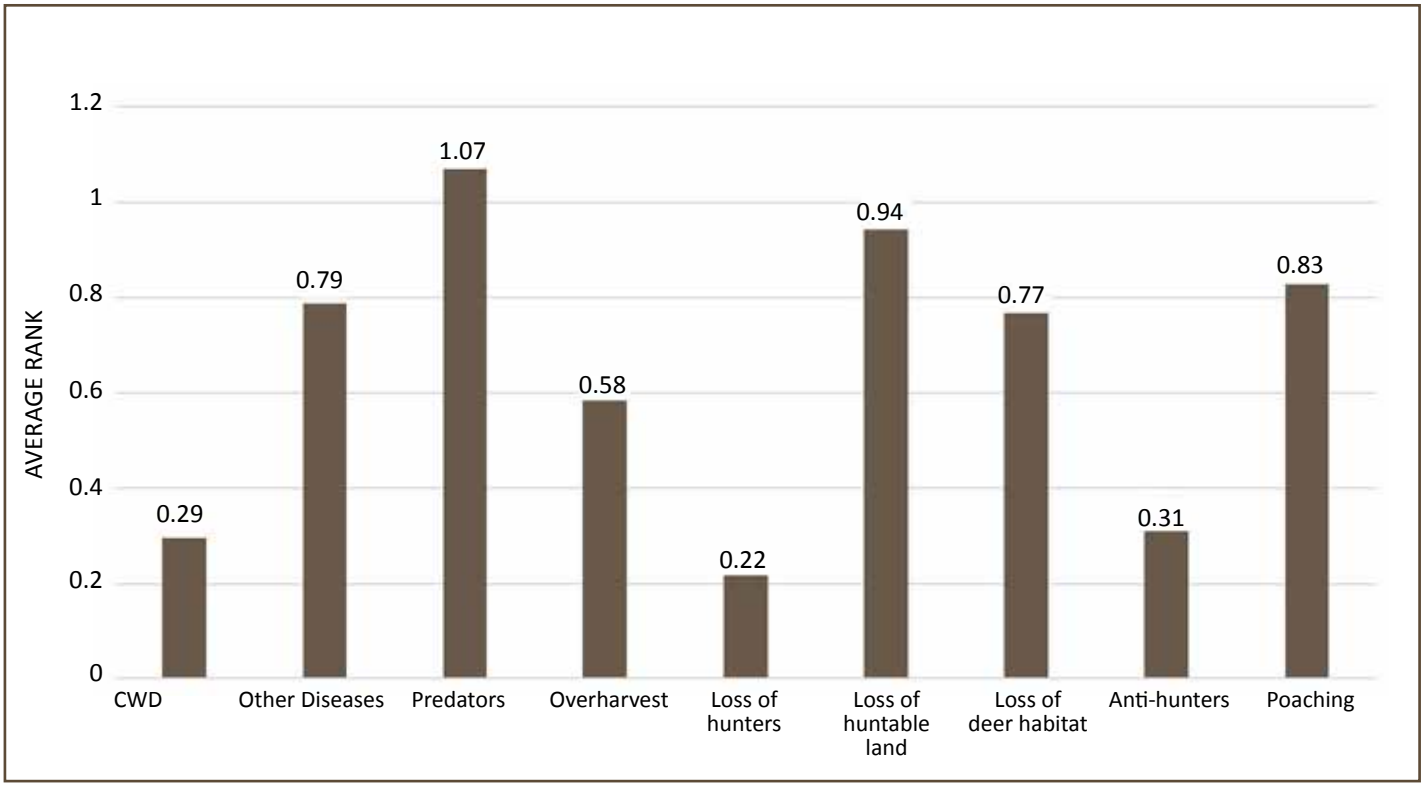

Figure 2. Question 25: Rank your opinion of the top three threats to the NC deer population. Results presented as the statewide mean response of the inverse rank (0=no rank, 3=highest rank / top threat) from the 2016 Deer Hunter Survey.

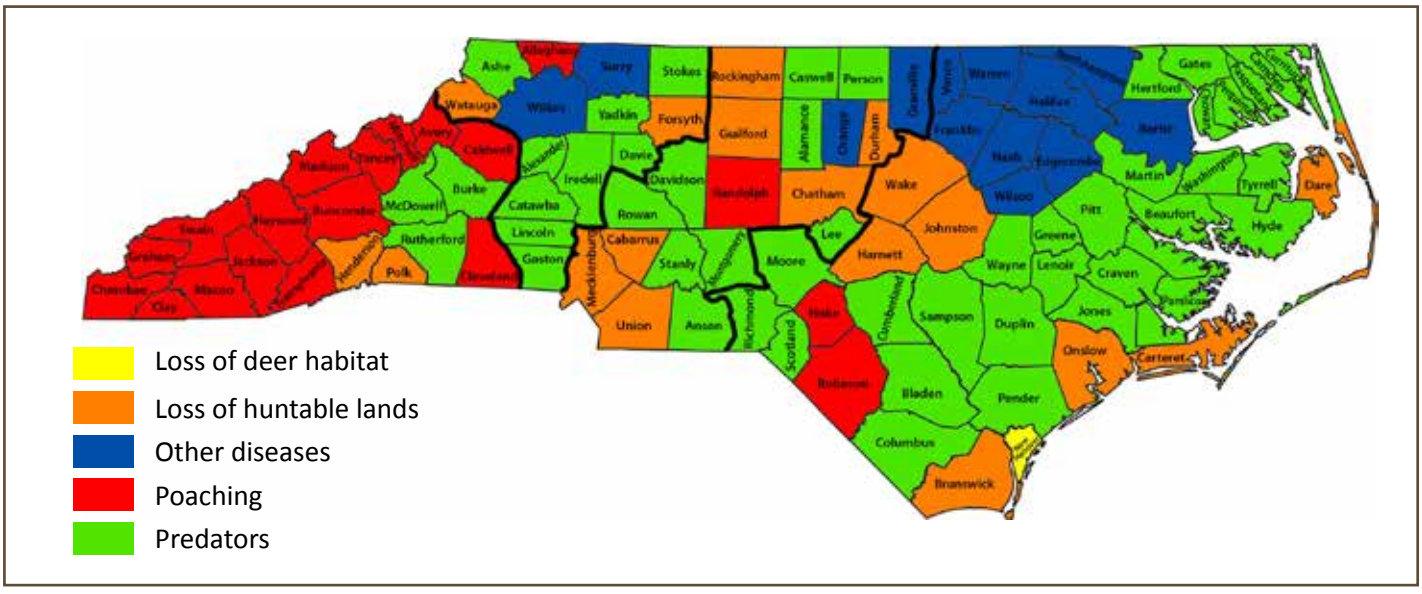

Figure 3. Rank your opinion of the top three threats to the NC deer population. Results presented as the threat with the highest mean rank (0=no rank, 3=highest rank / top threat) response per county from the 2016 Deer Hunter Survey.

Deer numbers have declined in parts of NC, with the most notable large-scale decline occurring in the Eastern Deer Season, covering about half the state. Reported antlered buck harvest trends are an index of deer population trends, and over a 10-year period (2007-2016) declined 23% in the Eastern Deer Season and 8.5% statewide. While coyotes have likely played a role in these declines, there are multiple contributing factors with variable impacts on the herd between years and by area. The primary factors for deer declines include disease, habitat quality, hunter harvest, and predators.

Hemorrhagic disease (HD) is a common disease of deer caused by two types of viruses — one producing blue tongue and the other producing epizootic hemorrhagic disease. HD appears to be increasing in distribution, frequency, severity, and virus serotypes in the US (Stallknecht et. al 2015). HD occurs in North Carolina every year with varying degrees of severity and distribution. Notable outbreaks have occurred in the past decade that have contributed to significant local and regional declines in NC deer numbers, most recently in 2007, 2011, 2012, 2014, and 2017. Deer herds can rebound from HD outbreaks, but population responses from HD setbacks are influenced by habitat quality, harvest rates, and predation rates.

Deer can exist in a wide variety of habitats, but deer numbers and potential for population growth are limited by habitat quality. The quality of habitat may be declining in areas of the state due to subtle, but significant changes in land use practices, including commercial and residential development, and increased efficiency in farming and forestry practices. For example, in western North Carolina where 1.2 million acres of National Forest remains intact, the lack of timber harvest has resulted in forests that now consist of predominately mature, deciduous, even-aged hardwood forest with few scattered wildlife clearings. While this forest type benefits some wildlife species, it provides low nutritional carry capacity for species like deer, and declines in some game species populations continue as the forests continue to age (Morin 2015).

While predation on adult deer has been documented, it is uncommon, and hunter harvest remains as the primary source of adult mortality in hunted populations.

While antlered buck harvest has declined 32% in National Forests in western NC, this is not the case on surrounding private lands. Western NC is the only large region in the state where deer numbers have notably increased over the last decade (2007-2016) as indicated by a 63% increase in antlered buck harvest. Interestingly, coyotes have been established longer in western NC than anywhere else in the state. White-tailed deer can adapt to changes in their environment and respond with behavioral modifications in the presence of threats, like predators (DeYoung and Miller 2011). It is conceivable deer will adapt or have already adapted in some areas to what was once a novel predator in the state.

While predation on adult deer has been documented (Chitwood et al. 2014), it is uncommon (Schrecengost et al. 2008; Vanglider 2008; Kilgo et al. 2010), and hunter harvest remains as the primary source of adult mortality in hunted populations (DeYoung 2011). Deer numbers are dependent on the number of adult females in the population, and doe harvest remains as the most important tool for deer managers to manipulate herd density (Kilgo et al. 2014). Bag limits (number of deer that can be lawfully harvested by day or season) and either-sex days (number of days does can be harvested in the firearms season) are the primary regulatory tools that impact doe harvest.

Doe bag limits and season lengths were increasingly liberalized over the last several decades to provide additional opportunity for hunters, improve or maintain herd and habitat condition, and reduce property damage issues. Most recently, doe harvest opportunity has been increased by expanding areas of the state with a maximum either-sex season (currently 80 of 100 counties), removing the daily bag limit in 2010, adding a week of blackpowder season in 2010, and allowing Sunday hunting with firearms in 2015. Hunters increased doe harvest over this period, most notably with a 28% increase in 2007 when unlimited "bonus antlerless tags" were implemented (Figure 4). This intentional increase in doe harvest has contributed significantly to deer declines. This herd reduction was warranted in parts of the state, but deer numbers are now at (31%) or below (48%) the desires of many deer hunters (Commission 2016).

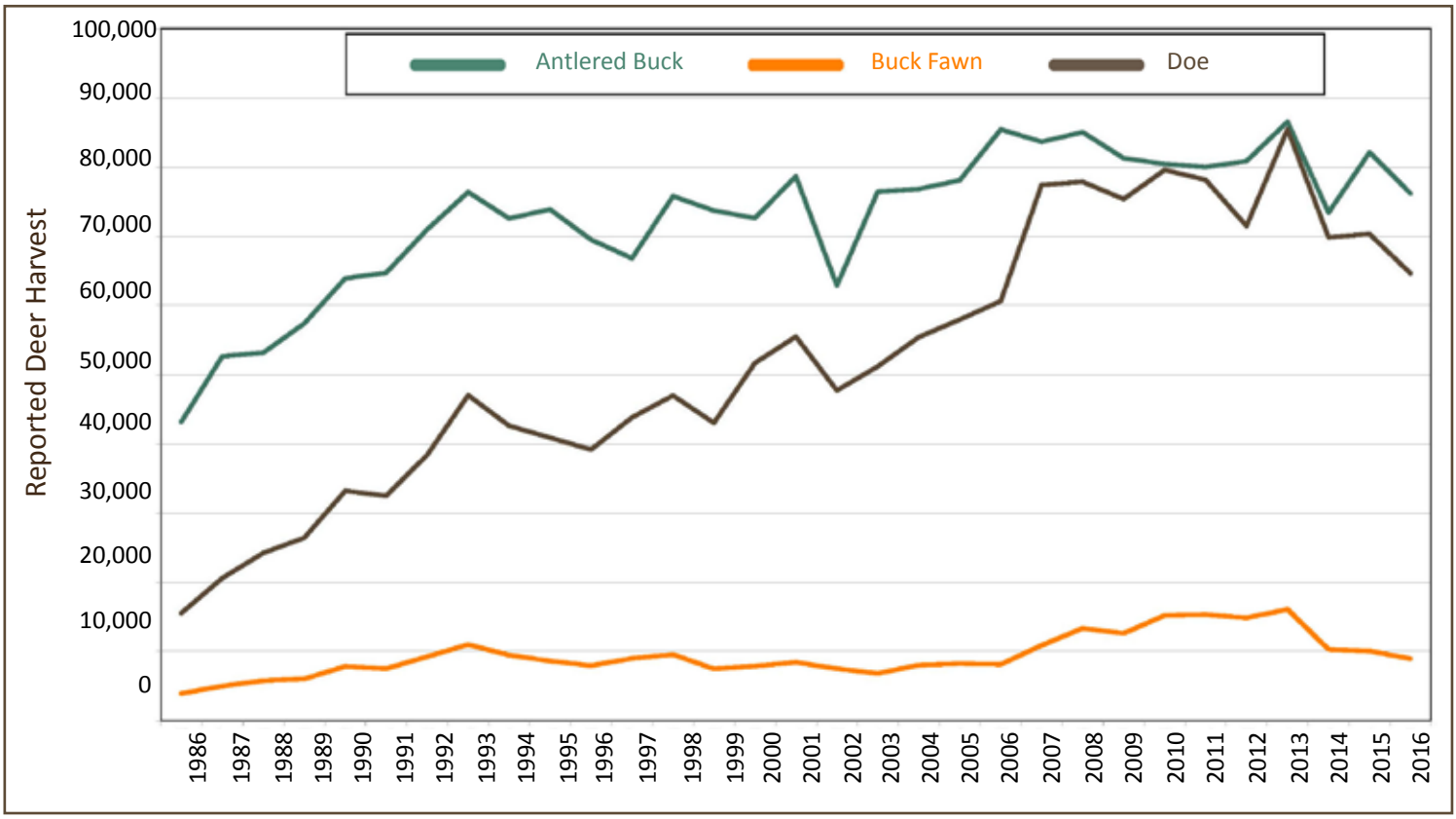

Figure 4. North Carolina reported antlered buck, buck fawn (button buck), and doe harvest from 1986-2016.

Deer populations can be less vulnerable to the effects of coyote predation not only through increasing deer densities, but also with improved birth synchrony (DeYoung and Miller 2011). Predation decreases rapidly as fawns mature. Survival rates are lowest during the first week of life, improve dramatically after 6 weeks of age, and level off by 10 weeks of age (Kilgo et al. 2012). Therefore, the window of time coyotes can effectively predate deer is condensed when most fawns are born during a shorter period. To accomplish this, harvest seasons should be anchored by breeding seasons with limited buck harvest prior to the peak breeding period. This ensures most does are bred during their first estrus cycle at the biologically correct time, resulting in fawns born in synchrony during an optimal time of year, close to spring green-up (Guynn et al. 1986). Where it is biologically and sociologically appropriate, the most effective method to increase or stabilize deer numbers at statewide and regional scales is through regulatory changes in season lengths, bag limits, and timing of harvest (Commission 2015).

Numerous studies on coyote and deer dynamics have been conducted in the southeastern US, including Ft. Bragg, NC. Research at Ft. Bragg documented coyotes were the leading cause of mortality for fawns during 2011 and 2012 (Chitwood et al. 2015b). This research provided valuable insight into the potential impacts coyotes can have on deer populations, but the study site and management activities at Ft. Bragg are not representative of the diverse landscape and activities that occur across the state. It is unclear if deer-coyote dynamics documented on Fort Bragg are representative of other landscapes and regions across North Carolina. The habitat (longleaf pine ecosystem) and habitat management practices (three-year prescribed fire intervals) at Ft. Bragg resulted in an extensive and drivable firebreak network, creating linear strips of edge habitat conducive to predator search behavior for prey. In addition, the soils of the sandhills region result in some of the poorest habitat in the white-tailed deer range (Shea and Osborne 1995). This habitat contributed to very low deer densities (2-4 deer/km2), starvation being the second leading cause of mortality for fawns, and starvation rates greater than reported in other studies (Chitwood 2014). Starving fawns are also vocal, which could increase their chances of being detected by predators and likely contributed to the high predation rates (Chitwood et al. 2014b). Research has shown that predation mortality does not normally suppress prey populations unless nutritional carry capacity of the habitat is low, at which point predation can result in additive mortality (Kilgo et al. 2014, Robinson et al. 2014, Chitwood et al. 2015). The most effective and least expensive way to increase deer numbers is to reduce doe harvest (Kilgo et al. 2014, Chitwood et al. 2015b), but in extreme situations with very low deer densities, poor habitat, and high predation rates on fawns, both intensive coyote trapping and reduction in doe harvest may be warranted if increasing or stabilizing deer numbers is desired in these areas (Chitwood et al. 2015b).

The Commission initiated an annual Deer Hunter Observation Survey in 2014 in part to increase understanding and monitor the impacts of coyotes on fawn recruitment across the state. Participants in this survey voluntarily record county-level observations of numerous species while deer hunting. These hunter observations to date included 187,557 deer observations (2014-2016) and provided a solid base-line to enable biologists to begin to monitor trends in deer observation rates (deer/hour) and ratios (fawns/doe, does/buck) over space and time.

The Commission initiated an annual Deer Hunter Observation Survey in 2014 in part to increase understanding and monitor the impacts of coyotes on fawn recruitment. (Photo: Melissa McGaw/NCWRC)

Statewide, hunters observed on average (2014-2016) 0.61 fawns for every adult (1.5+ years) doe. This ratio varied from 0.45 in Biological Deer Management Unit (BDMU) V to 0.66 in BDMU II (Figure 5, page 16). The observed fawn/doe ratio varied considerably between years, within each BDMU (Table 1, page 16). These observed ratios are relatively consistent with ratios reported through various methods and sources in the southeastern US. These observation data complement other annual deer data sets (reported harvest, hunter harvest survey, biological data collections) that biologists rely on to monitor and manage the herd.

A useful, reliable, and predictable model of the impact of coyotes on fawn recruitment or deer populations does not currently exist due to the complexities of predator/prey relationships and the confounding intricacies of deer management.

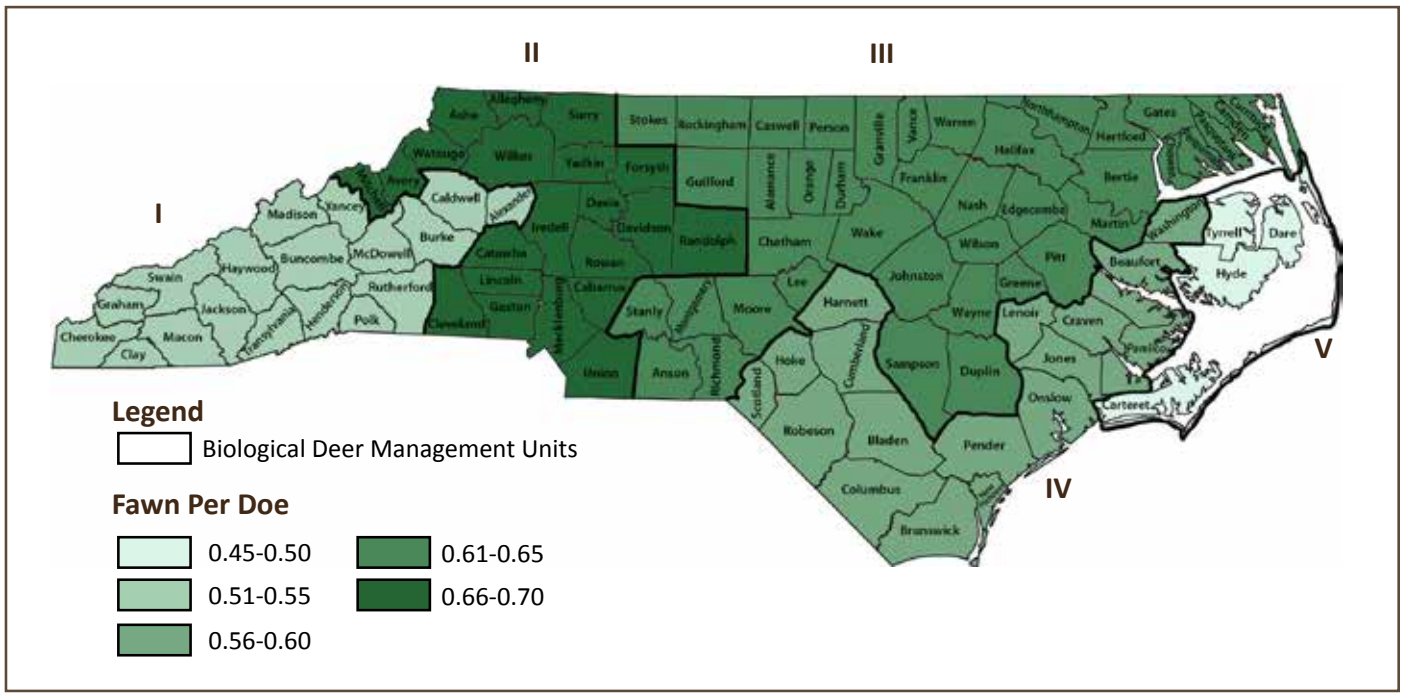

Figure 5. Deer Hunter Observation Survey average fawn per doe observation (2014-2016) by BDMU.

Table 1. Observed annual fawn/doe ratio per BDMU with 95% confidence intervals.

Year	BDMU 1	95% CI	BDMU 2	95% CI	BDMU 3	95% CI	BDMU 4	95% CI	BDMU 5	95% CI
2014	0.52	+/-.07	0.63	+/-.04	0.68	+/-.02	0.56	+/-.04	0.62	+/-.11
2015	0.64	+/-.05	0.68	+/-.03	0.57	+/-.03	0.61	+/-.04	0.50	+/-.13
2016	0.51	+/-.06	0.67	+/-.03	0.60	+/-.03	0.51	+/-.05	0.23	+/-.12
Avg.	**0.56**	**+/-.08**	**0.66**	**+/-.03**	**0.61**	**+/-.06**	**.56**	**+/-.06**	**0.45**	**+/-.23**

However, biologists can closely monitor deer population trends and account for predation along with other non-harvest mortality factors (e.g., disease, poaching, roadkill, and depredation), and adjust targeted hunter harvest rates with a more conservative approach that tolerates unpredictable temporal and geographic variability caused by predators and other factors. In addition to doe harvest regulations that promote sustainable herds at regional and statewide scales, the Commission continues to provide site-specific harvest prescriptions to landowners and technical guidance to improve habitat quality and herd production to offset the impacts of predation from coyotes and other predators.

Game Birds: Research in the prairie pothole region of the U.S. (i.e., the Dakotas) has shown that duck nesting success increases in the presence of coyotes as they suppress more common nest predators such as red foxes and raccoons (Sovada et al. 1995). Most coyote diet studies document low to no prevalence of wild turkey or other gamebirds in diets (Wagner and Hill 1994, Albers 2012), though coyote predation has been documented on radio-marked wild turkeys in Missouri (Vangilder

and Kurzejeski 1995) and Mississippi (Miller et al. 1998), as well as states in the Midwest (Paisley et al. 1998, Hubbard et al. 1999). Coyotes were documented as predating urban Canada goose nests in Chicago, Illinois, and research there suggested coyotes aided in limiting the urban Canada goose population (Brown 2007). Coyotes can also have effects on other mesopredators such as feral cats (Gehrt et al. 2013) and raccoons (Rogers and Caro 1998), in some cases helping to control their populations and lessen their effects on other species, such as some bird species (Rogers and Caro 1998, Schmidt 2002, Mezquida et al. 2006).

Because coyotes prey on smaller mammals, including nest predators (i.e., raccoons, foxes, skunks, opossums), coyotes can increase quail survivorship (Henke and Bryant 1999, Rollins and Carroll 2001). For example, in areas of Texas where quail numbers were highest, coyote abundance was also high and, conversely, in areas with low quail numbers, coyote numbers were also low (Rollins 1999). This relationship is due to a phenomenon known as "mesopredator release," in which there is an increase in the abundance of raccoons, skunks, badgers, gray foxes, and bobcats with the removal of a more dominant predator (e.g., the coyote; Henke and Bryant 1999). Raccoons, striped skunks, opossums, and gray foxes have been found to be the primary nest predators for quail (Hernandez et al. 1997, Fies and Puckett 2000). Snakes, avian predators, raptors, armadillos, and fire ants also impact nest and chick survivorship (Allen et al. 1995, Burger et al. 1995, Peoples et al. 1996, Mueller et al. 1999). While coyotes will consume quail if given the opportunity, it occurs in very low frequency (<1%) and is an incidental prey item (Henke 2002).

Research in Illinois suggests coyotes predate on urban Canada geese and can aid in limiting that population. (Photo: Wikimedia)

Changes in land management over the last 30+ years have resulted in conditions that make it more difficult to maintain high densities of quail over much of their distribution, due to increased habitat fragmentation, reduction in nesting cover, and increase in nest predators (Rollins and Carroll 2001). While there is no scientific evidence demonstrating that predator management in the absence of adequate bobwhite quail habitat will produce birds, there is a wealth of scientific evidence demonstrating that habitat management will significantly increase local quail populations in the absence of predator control (Smith 2010). Targeted removal of nest predators prior to and during nesting, coupled with habitat management and reducing artificial foods that increase nest predator populations (e.g., raccoons and deer feeders), may increase quail populations (Palmer et al. 2005).

Other Mammals: The impacts of coyotes on nongame species are not greatly studied but are becoming more concerning, especially as coyote populations expand into coastal areas that serve as nesting grounds for shore and seabirds as well as sea turtles. Many of these species are identified as species of greatest conservation need and some are specifically Federally listed as threatened or endangered. While long-term impact of nest predation on these taxa groups has not been studied in detail along the Atlantic coast thus far, evidence exist that as coyotes move into these habitats and establish themselves as a new and novel resident predator, they are likely having a significant impact on nest success. Targeted removal of

coyotes in these areas is and will continue to be an important component of all efforts to conserve and promote these shore nesting species until a greater understanding of these relationships is developed.

The impact of coyotes on other nongame species likely varies depending on the species, the habitats they use and reproductive behaviors. Coyotes may be beneficial to the management of some nongame species in some areas, especially those that might be perceived as undesirable by humans, such as groundhogs and rodents. Additionally, coyotes may prey on the predators of some nongame species and may in turn enhance survival or reproduction of these species.

Shore and Seabirds: To reduce susceptibility to predation, ground-nesting birds must camouflage their nests with herbaceous vegetation or lay eggs that blend well with bare ground such as sand and shells. Species that nest on open or sparsely vegetated beaches along the Atlantic Coast lay 1-4 cryptic eggs, and flush from nests if predators approach. Flushing increases adult survival and may be an attempt to direct the predator's attention to the adult rather than the eggs. Small clutch sizes allow these species to lay multiple clutches in a season if eggs are lost.

Many shore and seabirds nest on barrier, marsh, and dredged-material islands along the Atlantic Coast. Small (≤10 ha) islands, ≥1 km from the mainland are optimal nesting habitat for these birds because mammalian predators have historically been unlikely to swim to isolated islands or live on small islands year-round. However, increased recreation on islands by people has introduced discarded food and fish offal, attracting increased numbers of mesomammals (raccoons, etc.). Coyotes, however, had not been reported on coastal islands until the early 2000s. In 2009, Schweitzer and Meliopoulos (2015) detected predation on American Oystercatcher (*Haemotopus palliatus*) eggs by coyotes on Cumberland Island National Seashore (NS), Georgia. Cumberland Island NS is only accessed by boat; thus, coyotes had to swim to the large, barrier island and colonize it. Coyotes have essentially displaced nesting seabirds (e.g., Least Terns [*Sternula antillarum*]), and have reduced nesting success of shorebirds to zero on Cumberland Island NS.

To reduce susceptibility to predation, ground-nesting birds must camouflage their nests with vegetation or lay eggs that blend well with bare ground such as sand and shells. (Photo: Sue Cameron)

Recently, increased reports of coyotes on North Carolina's barrier islands have coincided with predation on shorebird nests and abandonment by colonial-nesting seabirds. Coyotes easily access NC barrier islands connected to the mainland with bridges such as Cape Hatteras NS and Pea Island National Wildlife Refuge. Barrier islands along the central and southern coast of North Carolina are connected to the mainland with bridges and are separated from the mainland by small sounds and the Atlantic Intracoastal Waterway, across which coyotes can easily swim (Schweitzer, personal observation). Several barrier islands are accessed only by boat but coyotes have colonized them as well.

One of North Carolina's largest Brown Pelican (*Pelecanus occidentalis*) colonies consistently nested on Island MN, a dredged-material island in the Pamlico Sound, near Oregon Inlet. The pelicans abandoned the nesting site in 2015 after

several chicks and nearly fledged young were killed. The island was not used for nesting by pelicans in 2016, and in March 2017, several dead pelicans that may have used the island for roosting, were found. Further, surveys of the island by Commission biologists in spring and summer 2017, found freshly killed Black Ducks (*Anas rubripes*) and pelicans, as well as a coyote den with pups. This was the first discovery of a denning coyote on islands in the Pamlico Sound. Camera traps on Island MN and adjacent Island L in fall 2017, recorded female adult coyotes. Pups were recorded only on Island MN.

Sea Turtles: Coyote predation of sea turtle nests on Cape Lookout National Seashore's islands was reported in 2016 (NPS 2016c; Altman, unpublished data). In 2017, there were 42 known cases of mammalian predation of sea turtle nests with incubating eggs: 3 by raccoon, 8 by fox, and 31 by coyote, including some nests with protective screening. It is unknown how many nests experienced unsuccessful predation attempts by predators, although coyote tracks were documented near incubating nests on beaches in New Hanover, Onslow, Carteret and Dare counties (Commission 2017).

Because many species that nest on islands along the Atlantic Coast are species of greatest conservation need, and the Piping Plover is federally listed as threatened, as are sea turtle species, management actions are necessary to increase their survival and productivity. Thus, properly timed and targeted removal of coyotes from islands with these nesting species is needed. In part to address this issue, the Commission entered into a Cooperative Service Agreement with the USDA APHIS WS in July of 2017 to provide predator management services to protect rare, threatened and endangered avian, mammalian, amphibian and reptilian species on public and private lands within the coastal counties of NC (Appendix G). Additionally, Best Management Practices for predator management are being completed by a team from Virginia Tech (Karpanty et al. *in draft*) as part of the Atlantic Flyway Shorebird Initiative conservation business plan (Andres et al. 2015). These BMPs will include nonlethal techniques to remove coyote predation pressure, but also humane lethal removal if nonlethal methods are not successful.

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Other Mammals: Although there have been numerous studies in the southeastern United States on coyote diet, the primary focus of this research has been to determine their impacts to white-tailed deer and other game species. While these studies do quantify the abundance of individual food items (small mammal species are often lumped together in one category, such as "rodents") in coyote diets, they do not attempt to determine effects of this predation on small game or other nongame mammal populations.

Poessel et al. (2017) determined that rodents and lagomorphs were the most prevalent food item in a Colorado study, indicating that rodents and native plants were consumed more often in areas of high-density housing and that deer, corn, and native plants were consumed more often in areas of low-density housing.

Several studies in North Carolina have documented that coyotes consume a variety of food types, including rabbit, white-tailed deer, rodents, anthropogenic material, vegetation, and invertebrates (Schrecengost et al., 2008, Dellinger et al.,

2011, McVey et al., 2013, Cherry et al., 2016). Coyote diets tend to be localized, change seasonally, and focus on the most abundant or preferred food sources (Stratman and Pelton, 1997, Tremblay et al. 1998, Bekoff and Gese 2003, Schrencengost et al. 2008). Swingen et al. (2015) noted that soft mast was the most common food item detected at Ft. Bragg, NC, followed by mammals and insects. Of the mammals consumed, white-tailed deer, rabbits, and hispid cotton rats were the most common species. A summary of results from different coyote diet studies can be found on page 69 in Appendix B.

In North Carolina, published data on coyotes impacts on other nongame mammals have been related primarily to red wolf reintroduction efforts. Coyotes negatively impact red wolf restoration efforts through hybridization (Roth et al., 2008, Hinton et al., 2013).

III. Challenges of "Coyote Control" by Population Reduction

For more than 100 years efforts have been devoted to controlling coyote populations across the United States. Despite these extensive control attempts, coyotes persisted and continued to expand their range. Coyotes now reside in all 49 continental states, most of Canada and Central America and are the most widely distributed wild canid in North America.

Physiological and Behavioral Adaptations

The biology and life history of coyotes are complex (Appendix B). The species has physiological and behavioral adaptations leading to high reproductive capacity, dynamic dispersal and colonization abilities, and high survival rates. These attributes result in coyotes being extremely resilient and capable of thriving in a wide variety of landscapes (including urban environments). Coyotes have demographic spatial structures capable of rapid recruitment and population self-regulation when a high number of coyotes are removed from the landscape. The mechanisms that enable this are compensatory reproduction (i.e., larger litter sizes, increased pup survivorship, and younger age of reproduction) and compensatory immigration (Windberg and Knowlton 1988, Morin 2015). These qualities confound efforts to manage or "control" coyote populations.

Extensive research has documented the ability of the coyote to adapt to changing environments and landscapes as well as to respond to changes in density resulting from harvest and other mortality pressures. In areas of high mortality due to efforts by hunters and trappers to reduce coyote density, coyote populations continue to persist through additional recruitment (Conner and Morris 2015), often referred to as "density-dependent negative feedback" (Murdoch 1994, Turchin 1999, Hixon et al. 2002). In these areas, coyote densities either remain the same or increase despite intense harvest levels. Conversely, research has shown in areas of light harvest where adult survivorship is high, recruitment into the population is lower due to decreased reproduction and immigration (Morin 2015).

Removal/Control

In an examination of 34 studies that conducted intensive predator removal, there was no decline over time in coyotes and other mesopredators (e.g., foxes, raccoons, striped skunks); year-to-year removal rates of coyotes remained relatively consistent and no studies showed long-term (>1 year) declines in coyote populations (Conner and Morris 2015). Research in South Carolina in which intensive coyote removal was conducted to increase fawn survival concluded that coyote control was not an effective method to increase fawn survival (Kilgo et al. 2014). While the fawn survival rate increased during the

first year of coyote removal (0.513), it declined (0.202) below pre-removal rates (0.228) during the second year of removal and an intermediate rate (0.431) the third year of removal (Kilgo et al. 2014). The decline in fawn survivorship observed is likely due to a combination of factors, including habitat quality, increased immigration of coyotes into the vacant territory, and higher reproductive potential of the coyotes (Knowlton and Gese 1995, Windberg 1995, Morin and Kelly 2017).

Intensive removal of coyotes is time-consuming and expensive, and research has yet to show it to be effective. In fact, in areas of high coyote mortality, higher densities of coyotes can occur versus areas with low mortality of coyotes (Morin 2015). When 60% of the coyote population is removed from an area, the population can recover within a year (Pitt et al. 2001). A three-year South Carolina study reduced coyotes by 78% each year and their numbers rebounded to pre-trapping levels in nine months (Kilgo et al. 2014). To cause a decline in the coyote population, 90% of coyotes must be removed. However, the population can recover in less than five years without continued intensive removal (Pitt et al. 2001). Local coyote populations are regulated by density dependence and demonstrate persistence and compensatory recruitment despite high mortality (Morin 2015).

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Local, small-scale coyote control efforts will not reduce coyote populations, as coyotes removed are rapidly replaced with other individuals. However, hunter and trapper harvest of coyotes may result in changes in temporal activity due to increased behavioral wariness demonstrated by the surviving coyotes (Kitchen et al. 2000). These coyotes may restrict their activities to nocturnal hours, to avoid people, and may become warier of trapping activity. In lightly exploited coyote populations, intraspecific competition for available territories, mates, and resources may result in highly limited recruitment, lower reproductive rates, and lower coyote densities.

Bounties and Harvest Incentive Programs

Historically, bounties have been used with little success to control coyote populations. The goals of these efforts have mostly focused on protecting livestock or wildlife or controlling disease. As other incentives (e.g., fur prices) to remove predators decrease, public pressure for a bounty often increases because of real or perceived changes in predator populations and actual or anecdotal reports of predation (Switzenberg 1950, Novaro et al. 2004). It is often thought that paying for proof that an animal of an unwanted species, like coyotes, is killed will result in more of those animals being killed, the population of that species declining, and increased benefits to natural resource management and satisfaction among interested stakeholders. However, these results are rarely realized and numerous bounty program case studies have led to conclusions that bounties are ineffective in achieving real declines of predators (including coyotes), at addressing livestock depredation, or at positively affecting populations of species targeted for protection (Bennitt 1948, Omand 1950, Switzenberg 1950, Nielsen 1973, Theberge 1973, Parker 1995, Bartel and Brunson 2003, Sillero-Zubiri et al. 2004).

One reason for the lack of effectiveness in bounty programs is that bounty hunters (or trappers) will hunt (or trap) in areas where predators are most abundant, which may not be the same area where the damage is occurring, or removal may be

indiscriminate and thereby not include the individual animals causing the damage (Gerstell 1941, Kartchner 1941, Nielson 1973). In some cases, there is no relation between reported damage and the actual number of predators on the landscape because most damage is attributable to a limited number of individuals (Bennitt 1948).

Many predators killed under a bounty program are killed incidental to other activities, such as hunting and highway driving, thus contributing little to reducing the overall population (Switzenberg 1950). Predators killed under bounty programs may themselves be predators on other species. So, removing those primary predators may result in increases in the prey species that in some cases are also undesirable (Leopold 1933, Kosack 1995). Bounty programs rarely deal with full operational costs, are open to corruption, and many times involve an expensive bureaucracy (Gerstell 1941, Kosack 1995, Sillero-Zubiri et al. 2004). Bounty programs provides an enhanced, subsidized recreation program for a small segment of citizens (Bartel and Brunson 2003). For example, the North Carolina coyote harvest for 2016-17 totaled an estimated 51,905 individuals. If each of those were reported for 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 (Table 2). Bounties are more expensive than a well-regulated system of hunting and trapping (Kartchner 1941), in some cases being five times more expensive than extension-trapper programs designed to target specific damage control objectives (Bennitt 1948).

Table 2. Potential costs if bounties were enacted statewide in North Carolina.

Bounty	# Coyotes Trapped[1]	Potential Costs	# Coyotes Hunted[1]	Potential Costs	Total Potential Costs
$25	4,497	$112,425	45,468	$1,136,700	$1,249,125
$50	4,497	$224,850	45,468	$2,273,400	$2,498,250
$75	4,497	$337,275	45,468	$3,410,100	$3,747,375
$100	4,497	$449,700	45,468	$4,546,800	$4,996,500

[1] Based on 2016-17 trapper and hunter harvest.

Coyotes are a species that requires sustained removal to reduce populations, as opposed to sporadic removals characteristic of bounty programs. They exhibit density-dependent reproduction and may increase their litter size in response to changes in food supply and population densities (Parker 1995). In areas where intense coyote harvest occurs, a temporary reduction in coyotes may occur, but this result may be short-lived because coyotes can respond by producing larger litters. In addition, killing individuals that are not causing damage can open territories for other individuals that have learned to depredate livestock or cause other damage.

In summary, the use of bounties for controlling unwanted wildlife, including predators, has been discontinued by most state and federal agencies because:

- they are ineffective in reducing actual damage because they often do not target problem individuals,
- circumstances surrounding the take of animals is largely unregulated,
- no process exists to prohibit animals taken from outside the damage management area from being presented for compensation,

- animals submitted for bounties are often taken incidentally and likely would have been harvested without incentives,
- bounties have a long history of use without achieving the intended results of reducing damage and predator population levels,
- for species like coyotes, removal can cause an increase in reproduction and increase in long-term population size, and
- killing predators that are not causing damage can open territories for predators that have learned to depredate on livestock or cause other damage.

In 2017, two southeastern states, Georgia and South Carolina, created harvest incentive programs for coyotes. These incentive programs are similar to bounty programs, in that an incentive is offered for a harvested coyote and there is no targeted area for coyote removal. Georgia's program, entitled the "Coyote Challenge," allows hunters and trappers to submit five coyotes per month to the wildlife agency in order to earn an entry into a monthly drawing for a lifetime hunting license. The stated goal of the program is to educate people on the tools available to take coyotes that are causing problems, and not to reduce or eradicate coyotes in the state. Georgia has no system in place to determine if participants increased their efforts to specifically harvest coyotes to qualify for the incentive. From April through June 2017, 40 participants brought in 160 coyotes, which averages one coyote per county in Georgia.

South Carolina's coyote harvest incentive program was initiated by the SC General Assembly (SCGA) in 2016. Funding for the program was provided by the SCGA. Experienced trappers captured four male coyotes in each of four game zones, for a total of 16 coyotes. The coyotes were ear-tagged by South Carolina Department of Natural Resources (SCDNR) biologists and moved from the original site of capture and released. Anyone who kills a tagged coyote receives a lifetime license. If a tagged coyote is harvested outside of South Carolina, the hunter still qualifies for the incentive. From November 2016 through October 2017, 7 tagged coyotes (44%) were taken, one of which was shot in North Carolina. The measure of success of South Carolina's program is whether hunters changed their behavior and increased their efforts to specifically hunt for coyotes. The SCDNR sent a survey to people who had voluntarily registered for the incentive program (N=2,055). Ninety-three percent of respondents reported that they had shot a coyote while deer hunting prior to the incentive program. and, despite the incentive, the net recruitment of hunters of "coyote hunters" was estimated at 19%. This increase did not appear to result in a proportional increase in the take of coyotes, as most of the tagged coyotes would have been harvested regardless of the incentive program (J. Butfiloski, SCDNR, pers. communication).

Coyotes are a species that requires sustained removal to reduce populations, as opposed to sporadic removals characteristic of bounty programs. They exhibit density-dependent reproduction and may increase their litter size in response to changes in food supply and population densities.

While novel programs such as these may have led to a slight increase in coyote hunting, most take occurs incidental to hunting other species (e.g., deer or wild turkey). Data from the Commission's annual Deer Hunter Observation Survey provides some insight into the potential effectiveness of providing a monetary incentive to encourage hunters to shoot more coyotes. Participants in this survey record county-level observations of both deer and coyotes on their observation

form (hunt diary). Since 2014, participants in the survey have reported 187,557 deer observations at an average rate of 0.78 deer observed per hour (780 deer /1,000 hours, Figure 6). These same deer hunters saw a total of 3,777 coyotes at an average rate of only 0.013 coyotes/hour, (13.42 coyotes /1,000 hours). Adding a financial incentive will not increase the number of coyotes these deer hunters see.

When avid deer hunters were asked at recent Commission public deer forums "What is your approach for managing coyotes where you hunt?," 61% said they "shoot coyotes when they see them," an additional 33% said they also "specifically hunt" or "specifically hunt and trap" them. While deer hunters see very few coyotes while hunting, most say that they attempt to kill every coyote they see. As such, financial incentives would neither increase the number of coyotes that deer hunters see or the number that they shoot. In 2016-17 North Carolina hunters killed an estimated 45,568 coyotes without any incentives or bounties (Table 3, page 28).

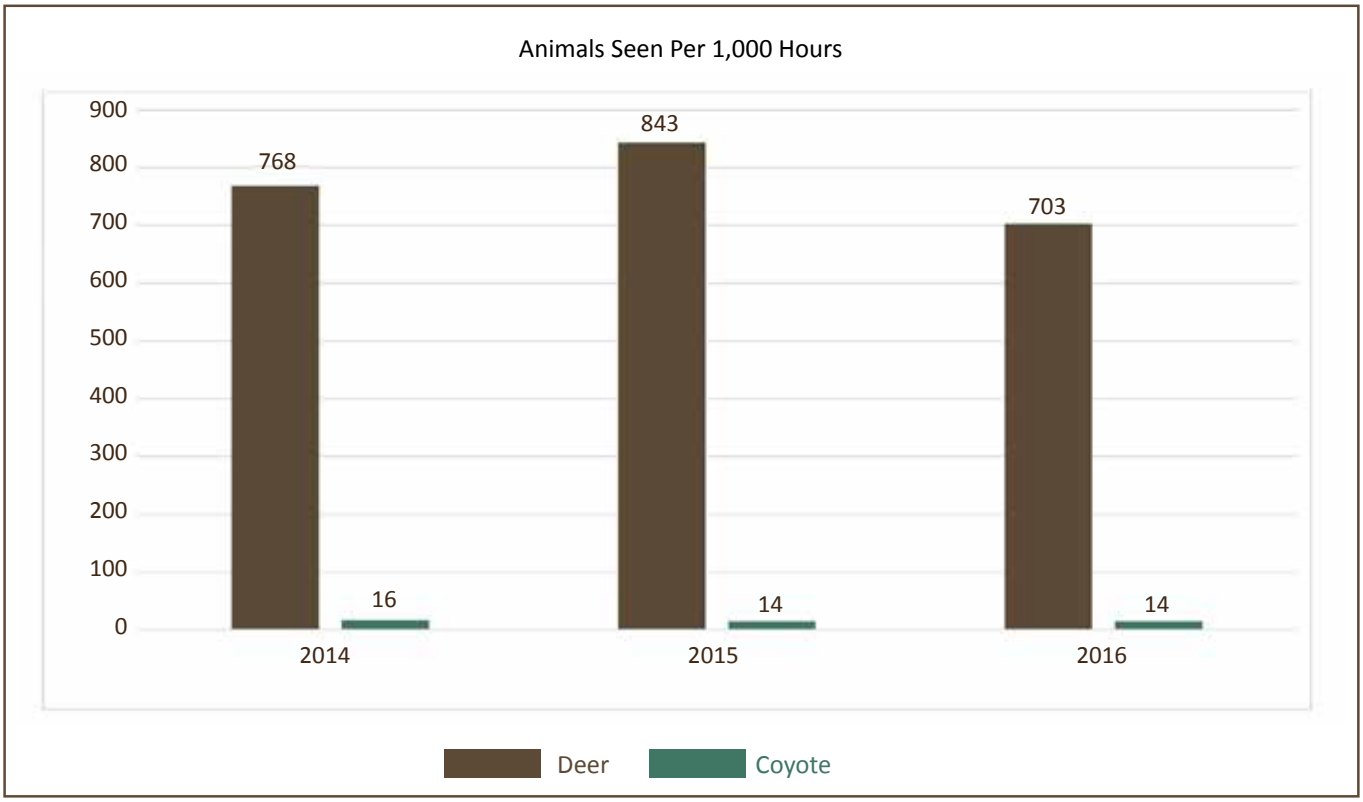

Figure 6. Observations of deer and coyotes by participants in Commission's Deer Hunter Observation Survey, 2014-2016.

Summary

While coyote population reduction ("coyote control") is often the first and only management approach that people suggest, it has proven ineffective. There is no silver bullet that will eradicate or permanently reduce free-ranging coyote populations. However, there are strategies that can address specific issues and concerns about coyotes that are more effective and cost efficient. Most of these strategies focus on implementing non-lethal techniques or, if necessary, removing individual problem coyotes. Strategies to address impacts of coyotes on other wildlife likely will require management actions directed at the species of interest rather than coyotes (e.g., emphasizing habitat productivity and quality or re-examining harvest season structures).

IV. Strategies for Coyote Management in North Carolina

There are many approaches to coyote management and a variety of available tools. Effective coyote management at the individual property scale requires that the coyote problem be identified, treatment options evaluated, and appropriate tool(s) applied to resolve the problem and prevent future problems from occurring. Therefore, communication is the Commission's most important tool; through it we inform landowners and citizens about coyotes and options for effective coyote problem management. The Commission uses a variety of methods to communicate to the public on the best approach, nonlethal or lethal, to address each individual circumstance. These include:

Education and Outreach

As stated previously, public attitudes and awareness of coyotes and coyote management vary considerably across the state. Citizens dealing with coyote problems come from a wide variety of backgrounds and experience levels with wildlife, and many are unfamiliar with coyotes to begin with. Educating the public about coyote biology and behavior as well as management options is critical to preventing and managing coyote problems, as well as encouraging coexistence with the species. The Commission provides education and outreach related to coyotes through a variety of avenues.

Technical Guidance: Technical guidance, the transfer of technical knowledge from professional staff to citizens, is a critical component of the Commission's approach to all wildlife damage management, including coyote management. Staff from across the Commission are available to provide technical guidance, including district wildlife biologists and wildlife enforcement officers at the local level, and staff from the Private Lands and Surveys and Research Programs at the state level. Staff work with citizens to identify the nature of their coyote problems and advise on the most effective lethal and nonlethal tools to address the problem and prevent future concerns. Staff are available to citizens by phone and email, and site visits can be conducted if/when needed. District wildlife biologists and wildlife enforcement officers issue depredation permits when merited for damage management trapping of coyotes outside of the regulated trapping season. Contact information for district wildlife biologists is available on our website: (ncwildlife.org/Portals/0/Hunting/Documents/WMDistrictBiologistContacts.pdf).

NC Wildlife Helpline: In addition to the technical guidance provided by field staff, the Commission launched a call center for human-wildlife interactions known as the NC Wildlife Helpline (Helpline) in April 2017. The Helpline is staffed by trained wildlife biologists who provide technical guidance over the phone for a variety of wildlife concerns including questions about coyotes. Helpline staff provide information about coyote biology and behavior, recommend lethal and nonlethal management tools, and connect citizens to resources such as Wildlife Damage Control Agents and licensed trappers. The Helpline is available to the public Monday-Friday, from 8 a.m. to 5 p.m. toll-free by phone at 866-318-2401 or by email at wildlifehelpline@ncwildlife.org.

The Commission developed a human-wildlife interaction database in 2015 to better track reported human-wildlife interactions. Staff from the Wildlife Management Division and the Helpline input data from public inquiries including the species involved, type of concern, and location of the problem. From January 2015 through September 2017, 15,351 interactions were recorded in the database, 5.5% of those calls (850) involved

coyotes. Calls regarding coyotes were related to coyotes suspected of causing damage or being perceived as nuisance (76%), observations of coyotes (19%), and reports of suspected sick or injured coyotes (6%). Data collected from the HWI database will be used to monitor the types of concerns/issues so that appropriate education and outreach efforts can be developed and targeted to the human-coyote interactions that are common in specific areas.

Educational Materials: The Commission has many resources available to the public related to preventing and resolving human-wildlife interactions, including coyotes and coyote management (Figure 7). These resources include:

- coyote species page on the Commission website with links to information about coyote biology, regulations, management, and other resources: ncwildlife.org/coyote,
- coyote species profile, which provides an overview of coyote biology,
- *Coexisting with Coyotes* flyer, which outlines common coyote questions and provides quick tips for preventing and addressing problems with coyotes,
- Coyote Biology and Natural History presentation, a slide presentation about coyote biology in NC, and
- *Hazards of Feeding Wildlife* flyer, which reviews the risks of intentional feeding of wildlife, including coyotes.

Commission staff continue to improve these materials, and develop additional resources including:

- a brochure outlining legal rights of landowners regarding coyotes
- a rack card and door hanger sign with coexisting messages
- materials specifically targeted for livestock producers

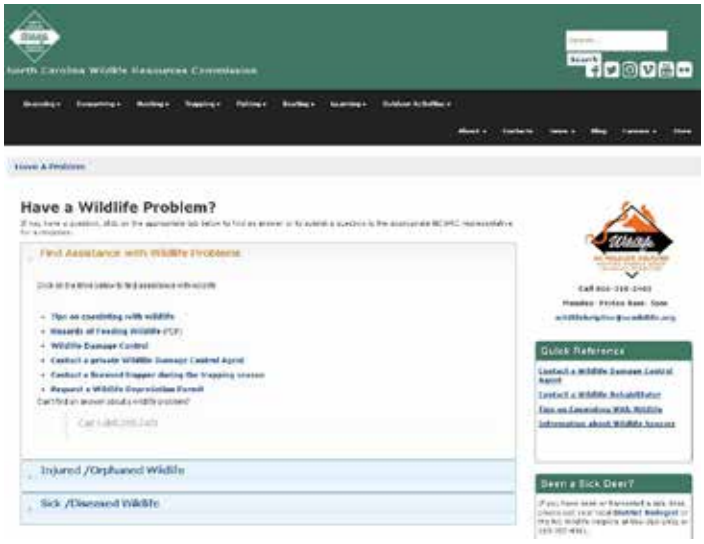

Figure 7. Resources are available on the Commission's website to help the public with preventing or resolving wildlife conflicts (www.ncwildlife.org/Have-A-Problem).

In addition to publications and the Commission website, information about coyotes will be shared across other digital platforms (Facebook, Instagram, and Twitter), and videos related to coyotes and coyote management will be developed to provide another resource for citizens. Engaging partner organizations will ensure that resources are shared and reach a broader audience.

Coyote Management Workshops and Programs: In 2016, Commission staff developed a Coyote Management Workshop in conjunction with the US Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services and the NC Cooperative Extension Service. The workshop is a three-hour program for citizens that provides an overview of coyote biology, non-lethal and lethal management tools, and includes a demonstration of trapping techniques. In the 2016 pilot year, four workshops were presented and all were extremely well received. Based on the success of the pilot program, 13 workshops were held in 2017, including at least one in each of the nine Commission districts. Workshop locations were targeted to areas where coyote problems and concerns were known to occur. An average of 30 participants attended each workshop, with over 400 participants across the State.

The Commission will continue to offer workshops, and will work to develop a second workshop focused on coyote management in urban and suburban settings, where some lethal tools may be prohibited based on local ordinance. Additionally, Commission staff will continue to provide individualized coyote programs to respond to the needs of specific audiences such as homeowner's associations, livestock associations, city councils, and civic organizations.

Partnerships: Disseminating information and management recommendations about coyotes can be a challenge in a large, diverse state such as North Carolina. Working with partners to ensure that information about coyotes reaches people across the state is critical. The Commission has worked successfully with several key partners to develop and disseminate educational materials and training regarding coyotes and coyote management, including the US Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services and the North Carolina Cooperative Extension Service. The agency will continue to expand partnership efforts to include groups such as:

- State Agencies (e.g., State Parks, NC Museum of Natural Sciences, NC Zoo),
- Livestock Associations,
- Animal Control Organizations,
- Colleges and Universities,
- Non-profit Organizations focused on conservation/wildlife/agriculture, and
- Civic Organizations and Clubs.

Appropriately selected partner organizations will assist in reaching new audiences, refine messaging to fit various demographics, and expand the scope and scale of education and outreach efforts. Working with partners may also improve the public's willingness to engage in coyote management and increase credibility of the Commission's recommended coyote management actions.

Coyote Management Tools

Tools for managing coyotes can be grouped into two broad categories: nonlethal tools and lethal tools.

Nonlethal Tools: Lethal removal of coyotes may be the least effective in many circumstances. A wide variety of nonlethal tools are available for the prevention and management of coyote problems. Other nonlethal tools often revolve around modifying human behaviors and practices to prevent or reduce the likelihood of human-coyote conflicts. For example, practices such as leashing dogs, keeping cats indoors, and securing small livestock in lighted corrals at night are modifications of human behavior that significantly reduce the chance for coyote depredations on those domestic animals. Nonlethal tools focus on addressing the root cause of coyote damage to prevent problems in the long run, and can be paired with lethal tools as needed to meet management objectives in the short run.

Setting realistic, achievable management objectives for coyotes is important, and landowners should focus on addressing clearly defined problems on their property. Managing coyotes often requires the use of several management tools, and the Commission recommends landowners take an integrated approach to coyote management, using both lethal and nonlethal tools as needed to meet objectives. Options and recommendations for the use of lethal and nonlethal tools come from a review of relevant literature and field experiences of Commission staff and partners within the context of common coyote problems and concerns.

Lethal Tools: Lethal tools can be used for take of coyotes by hunting or trapping, as well as for damage management and prevention. North Carolina allows coyotes to be killed through regulated hunting and trapping, and under depredation permits. In addition, private landowners may shoot coyotes in the act of depredating at any time. Lethal tools may need to be paired with appropriate nonlethal tools to ensure coyote damage management and prevention objectives are met.

Hunting, trapping, and take under depredation permits are the lethal tools regulated by the Commission. The number of coyotes taken is estimated using an annual hunter harvest survey, an annual trapping survey, and through reporting of take under depredation permits. Approximately 52,000 coyotes were harvested in the 2016-17 hunting and trapping seasons (Table 3).

Hunting: Coyotes are not classified as either game or furbearing animals in NC, but instead are classified as wild animals (i.e.,nongame). The Commission has authority to set hunting seasons, bag limits, and manner of take, including the use of artificial lights for coyotes. Currently there is no closed season for hunting coyotes in North Carolina. A hunting license is required to hunt coyotes, except that landholders (owners and those leasing land for cultivation) are not required to purchase a license. Electronic calls may be used and coyotes may be hunted at night with artificial light, except on private lands in the counties of the Albemarle Peninsula (Beaufort, Dare, Hyde, Tyrrell and Washington). Coyote hunting in those counties is restricted to daytime only and requires a permit from the Commission.

Table 3. Statewide estimates of coyote depredation take, hunter harvest and trapper harvest from 2010-2011 season through 2016-2017 season.

	Depredation	Hunter Harvest		Trapper Harvest		
Year	Estimated Coyote Depredation Take[1]	Estimated # Coyote Hunters[2]	Estimated Coyote Harvest[2]	#Licensed Trappers[3]	Reported Coyote Harvest[4]	Estimated Coyote Harvest[5]
2010-11	66	32,388 (±2,322)	36,041 (±7,327)	2,186	2,843	4,141 (±627)
2011-12	101	25,770 (±1,816)	31,622 (±7,557)	2,640	3,458	5,393 (±774)
2012-13	91	26,059 (±1,777)	27,152 (±3,952)	3,125	3,858	5,419 (±917)
2013-14	203	34,477 (±2,342)	34,972 (±4,769)	3,696	3,975	6,951 (±1,141)
2014-15	78	35,254 (±2,525)	43,507 (±7,993)	3,547	4,196	7,611 (±1,605)
2015-16	112	31,321 (±2,306)	47,649 (±13,212)	3,077	4,177	7,645 (±1,451)
2016-17	Data not yet available	37,874 (±2,885)	45,568 (±12,366)	2,941	4,497	6,337 (±958)

[1] Based on mandatory reports from Wildlife Damage Control Agents and USDA-WS depredation take, and voluntary reports from WRC-issued permits.
[2] Estimates are from the voluntary Hunter Harvest Surveys of license holders. The number of hunters and harvest are estimates and based on number of hunters responding to survey. Hunters include both still hunters and houndsmen.
[3] Number of licensed trappers based on the sale of resident, county and non-resident trapping licenses during each trapping season.
[4] Coyote trapping harvest is based on number reported by licensed trappers responding to the annual voluntary trapper harvest.
[5] Trapper harvest estimates were calculated to account for non-respondents to survey.

To gain a better understanding of the hunter harvest of coyotes, the Commission added the species to its annual hunter harvest survey in the 2005-06 season. Survey results suggest an increasing trend for coyote harvest by hunters from 2005-06 through 2014-15, with harvest levels stabilizing the last three years (Figure 8). Estimates of take for this species have a large standard error so results must be interpreted with caution. In the 2016-2017 hunting season, NC hunters harvested an estimated 45,568 coyotes. Most coyote harvest is incidental to other types of hunting, such as deer hunting (Chitwood 2014). While we do not know how many NC hunters devote effort specifically to hunt coyotes (i.e., use predator calls or go night hunting), approximately 38,000 hunters who responded to our hunter harvest survey said that they either hunted coyotes or killed one or more coyotes (1.2 coyotes/hunter) during the 2016-17 hunting seasons. Hunter harvest take of coyotes is highest in the Piedmont region, followed by the Coastal Plain and Mountains (Figure 9, page 30). While regional harvest statistics demonstrate that coyote hunting occurs across the entire state, regional harvest levels should not be considered indicators of coyote abundance as they may be more related to land cover types, property ownership patterns, hunter densities, deer season timing and length, and human land use decisions.

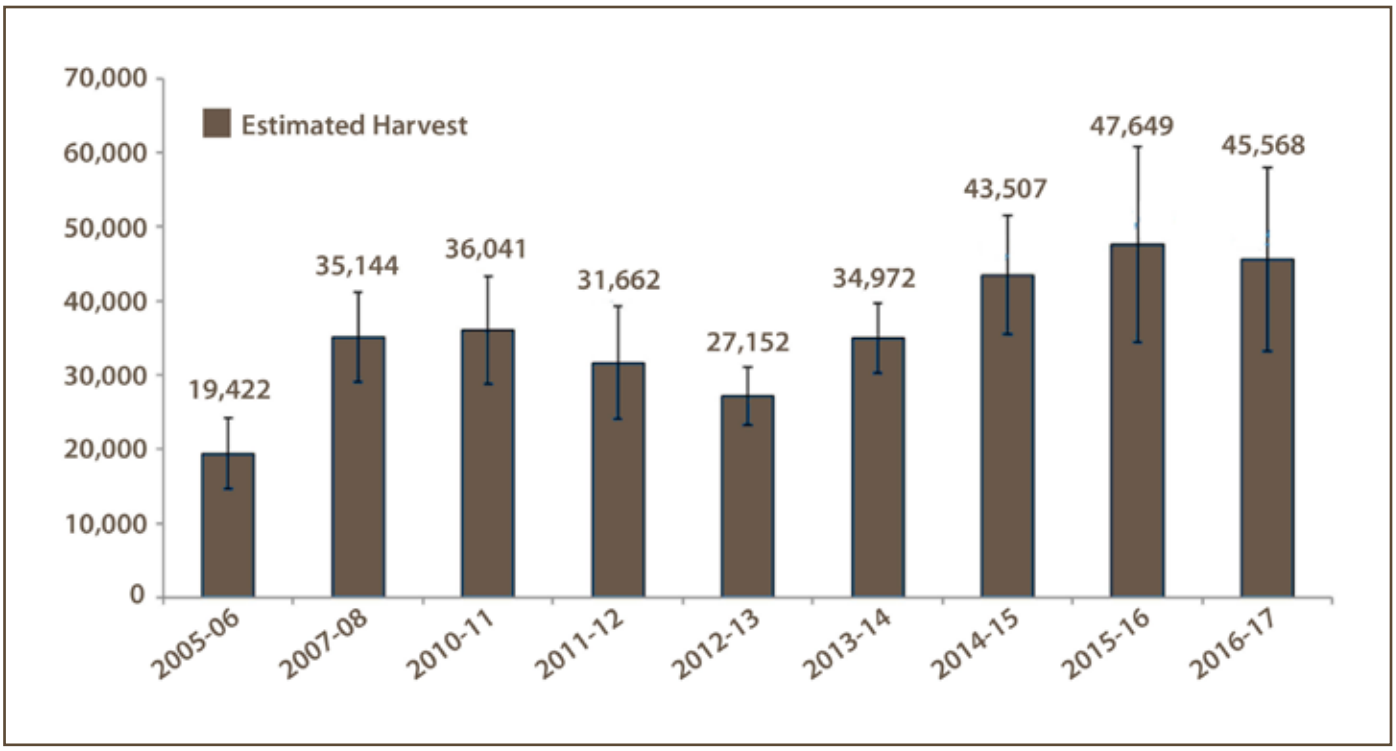

Figure 8. Estimated coyote harvest by hunters from 2005-06 through 2016-17 season. Note: No data for 2009

Trapping: Trapping during the regulated trapping season is an important proactive wildlife management tool. The Commission has the authority to set trapping seasons and bag limits on furbearer species and wild animals, including coyotes. However, legal trapping devices are specified by statute (NCGS § 113-291.6). An annual trapping license is required to trap coyotes, except that landholders (owners and those leasing land for cultivation) are not required to purchase an annual trapping license. Trapping coyotes is allowed during the Commission established trapping season and when any fox trapping season established by local law is open (Figure 10, page 30). The trapping season is established during a time of

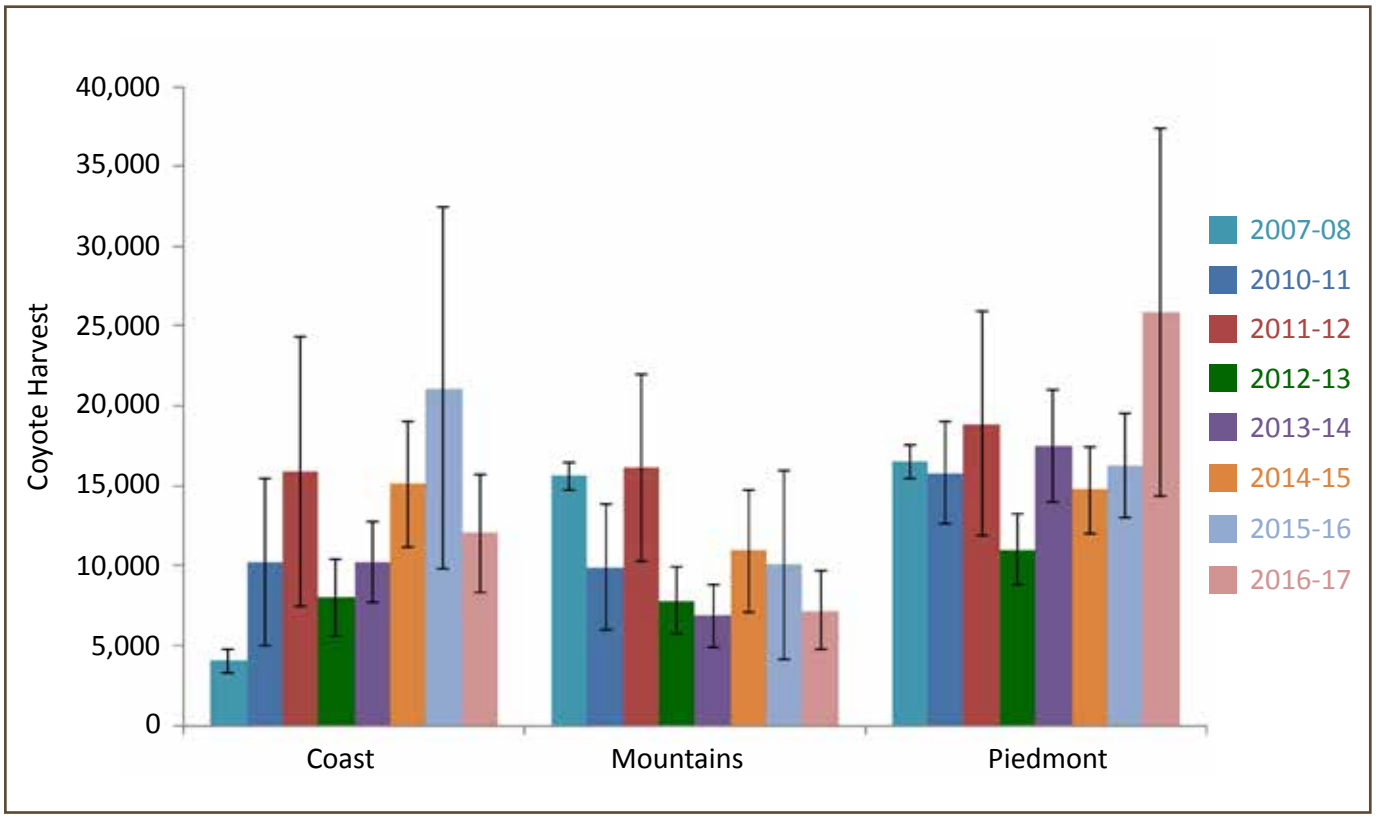

Figure 9. Estimated harvest of coyotes by hunters in each of the furbearer management regions from 2007 through 2017. Note: No data for 2009.

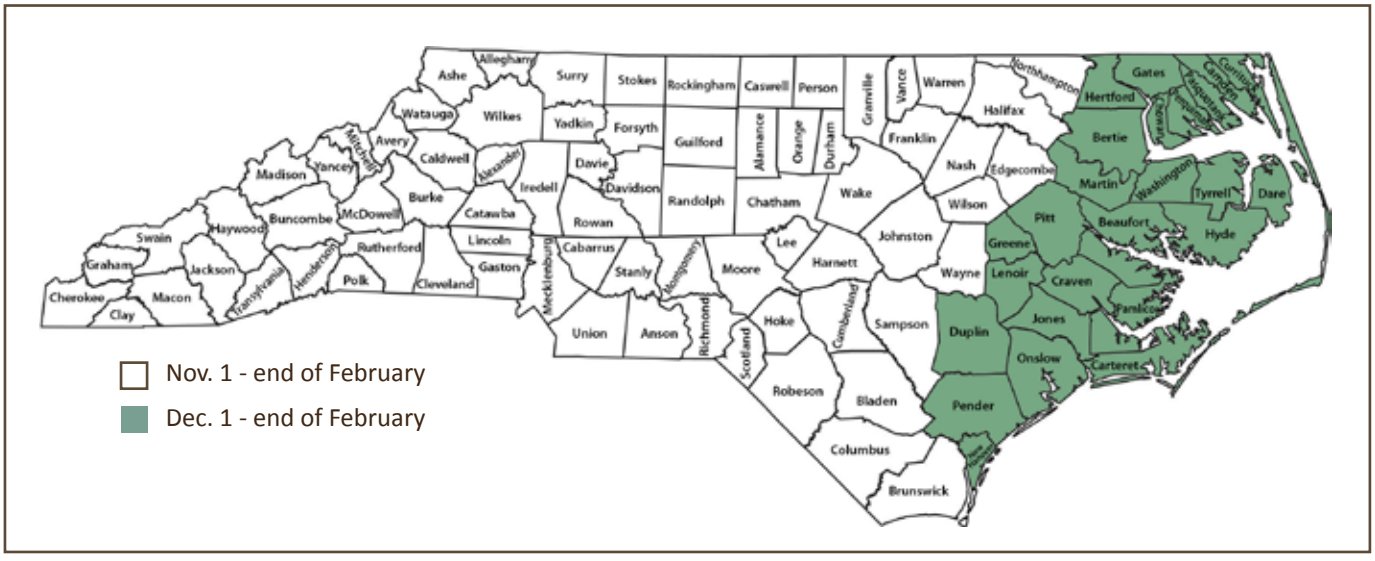

Figure 10. Regulated trapping seasons in North Carolina.

year when young wildlife is independent, temperatures do not cause distress or mortality for the animal while in the trap, and the fur is prime, thereby allowing sustainable utilization of the resource. Unlike the hunting season on coyotes, there is no year-round trapping season on coyotes. While a hunter can correctly identify his/her target before discharging his/her weapon, it is possible to capture non-targets (e.g., dogs, bobcats, foxes) while coyote trapping. Capture of non-targets

outside the established trapping season can negatively impact reproduction (e.g., the dependent young) and increase the risk of heat stress to non-target animals. Numerous stakeholders have opposed a year-round coyote trapping season due to animal welfare of non-targets. In addition to selling coyote fur, live coyotes taken by during the legal trapping seasons may be sold to Controlled Fox Hunting Preserves across the state, as established under NCGS § 113-273(g). It is illegal to breed or import coyotes into North Carolina (NCGS § 113-294(o)).

The foothold trap is the primary device used for trapping coyotes. The Association of Fish and Wildlife Agencies has completed extensive trap testing on many types of traps to evaluate them for humaneness, efficiency, selectivity, safety, and practicality (White et al. 2015). This program is known as Best Management Practices for Trapping, or BMPs. Results from the trap testing are used to make recommendations on traps that have been scientifically proven to be humane and efficient at trapping certain species. While the Commission does not have the authority to regulate trapping devices, trapping BMPs are promoted through the Commission website at www.ncwildlife.org/bmp.

In 2001-02, the Commission initiated a voluntary survey of all licensed trappers to determine the harvest of coyotes (Table 3, page 28). North Carolina trappers successfully trapped an estimated 6,337 coyotes during the 2016-17 trapping season (Figure 11). While harvest of furbearer species often mirrors pelt prices, coyote harvest has been steadily increasing since the 2002-03 season, likely due to both an increasing coyote population and an increasing interest in harvesting coyotes (Table 3, page 28). Coyote harvest levels in the Mountain Furbearer Management Region are lower than that of the Piedmont and Coastal Plain furbearer management regions (Figure 12, page 32). While regional harvest statistics demonstrate that coyote trapping effort occurs across the entire state, regional harvest levels should not be considered indicators of coyote abundance as they may be more related to land cover types, property ownership patterns, open fox trapping seasons, and human land use decisions.

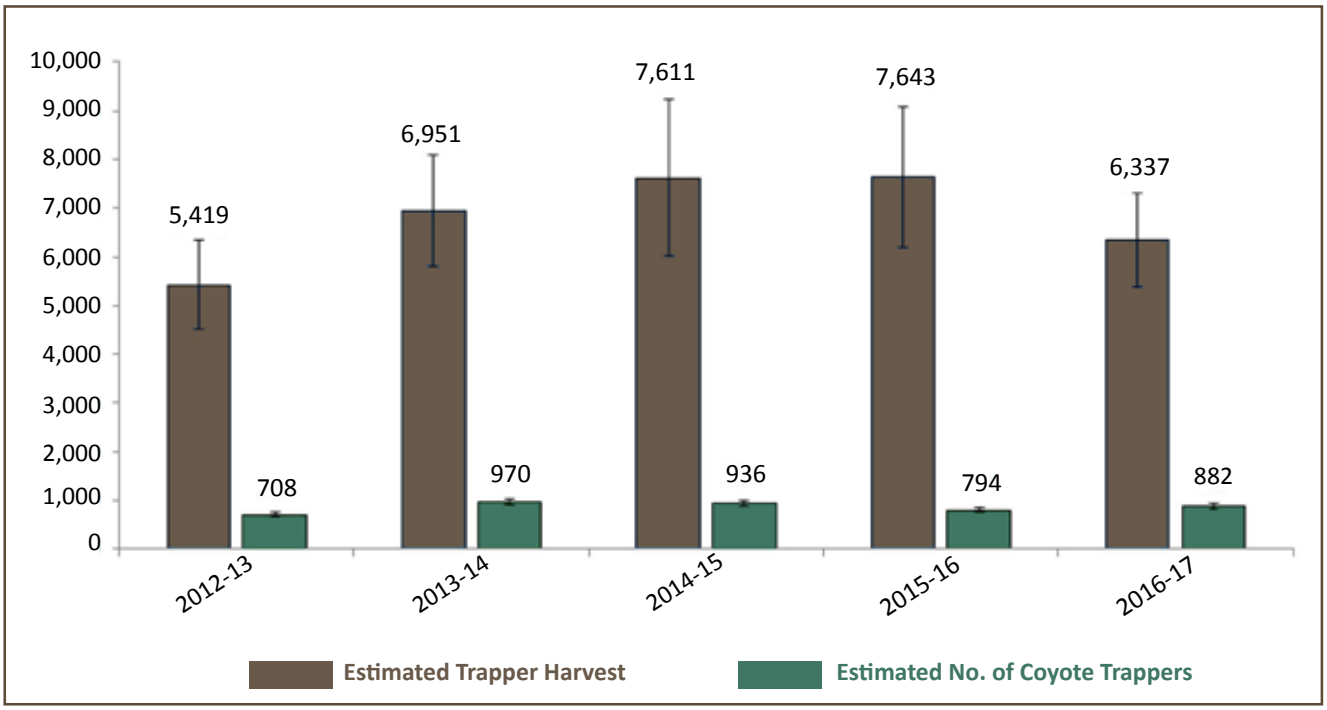

Figure 11. Estimated number of coyote trappers and estimated coyote harvest from 2012-13 trapping season through 2016-17 trapping season.

While the total number of coyotes taken by hunters (45,568 in 2016-17) in NC is greater than that taken by trappers, trappers took more coyotes per person (7.2 coyotes/trapper) than hunters (1.2 coyotes/hunter) (Figure 13, page 33). By allowing trapping on their property during open trapping seasons landowners can potentially prevent conflicts and possibly reduce costs of addressing conflicts since trappers can recoup their expenses (e.g., gas, equipment, time) by selling the fur of animals while it is prime, thus not charging for their services as they would under an out-of-season depredation permit.

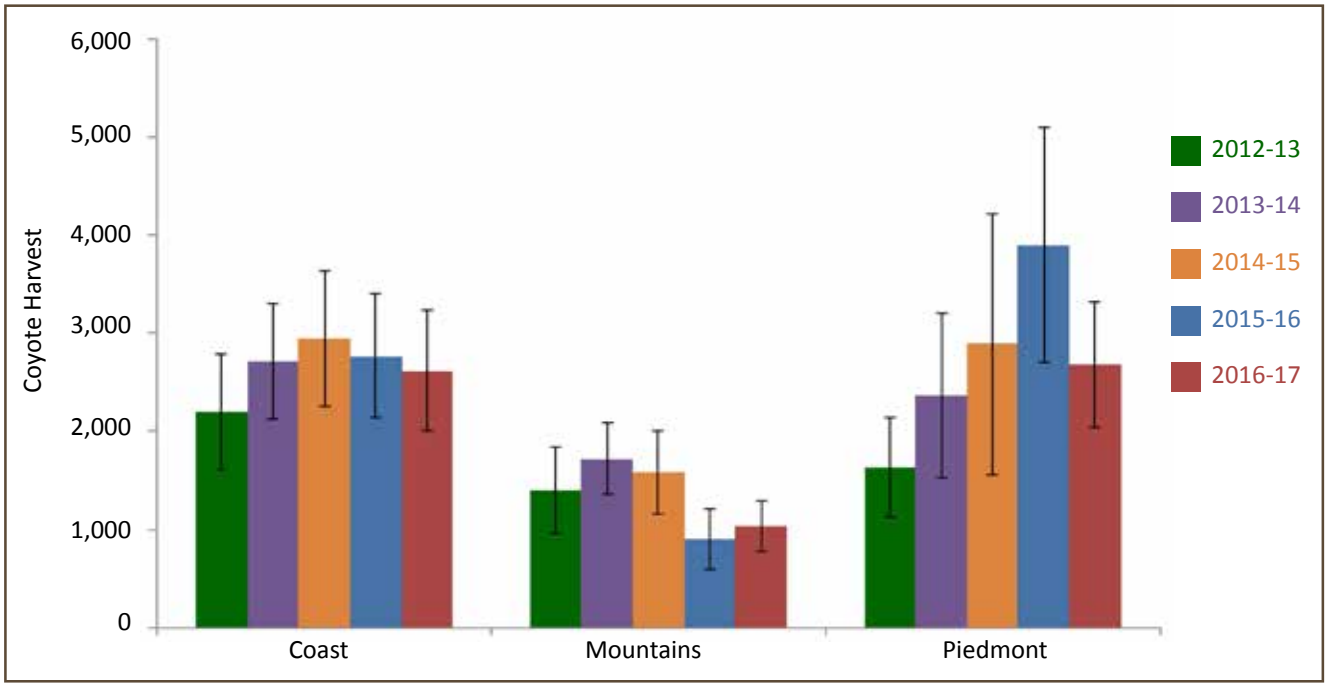

Figure 12. Estimated harvest of coyote by licensed trappers in each of the furbearer management regions from 2012-13 season through the 2016-17 season.

Relationship between Coyote Trapping and Fox Trapping Seasons: Similarities between foxes and coyotes result in an inability to separate the management of one species from the other. In June 2011, the NC General Assembly directed the Commission to study fox and coyote populations and to recommend management methods and controls designed to ensure statewide conservation of fox populations while managing adverse effects of coyote populations. In the report from this evaluation (Appendix E), we established a long-term goal for the Commission to improve the efficiency and effectiveness of coyote control measures by reducing regulatory barriers for our citizens while ensuring the sound conservation of fox populations.

Essentially the same techniques are used to trap coyotes and foxes. Therefore, trappers are reluctant to trap for coyotes in counties that do not allow fox trapping, because they must release all foxes rather than keeping them to sell. Harvest of coyotes by trappers is consistently lower in counties that do not have a fox trapping season (Table 4, page 34). For example, during the 2015-16 regulated trapping season, counties with fox trapping seasons (n=43) had a 61% higher harvest of coyotes than counties without a fox trapping season (n=57). We have observed a 94% to +3,000% increase in coyote harvest after a county has been opened to fox trapping (Table 5, page 35).

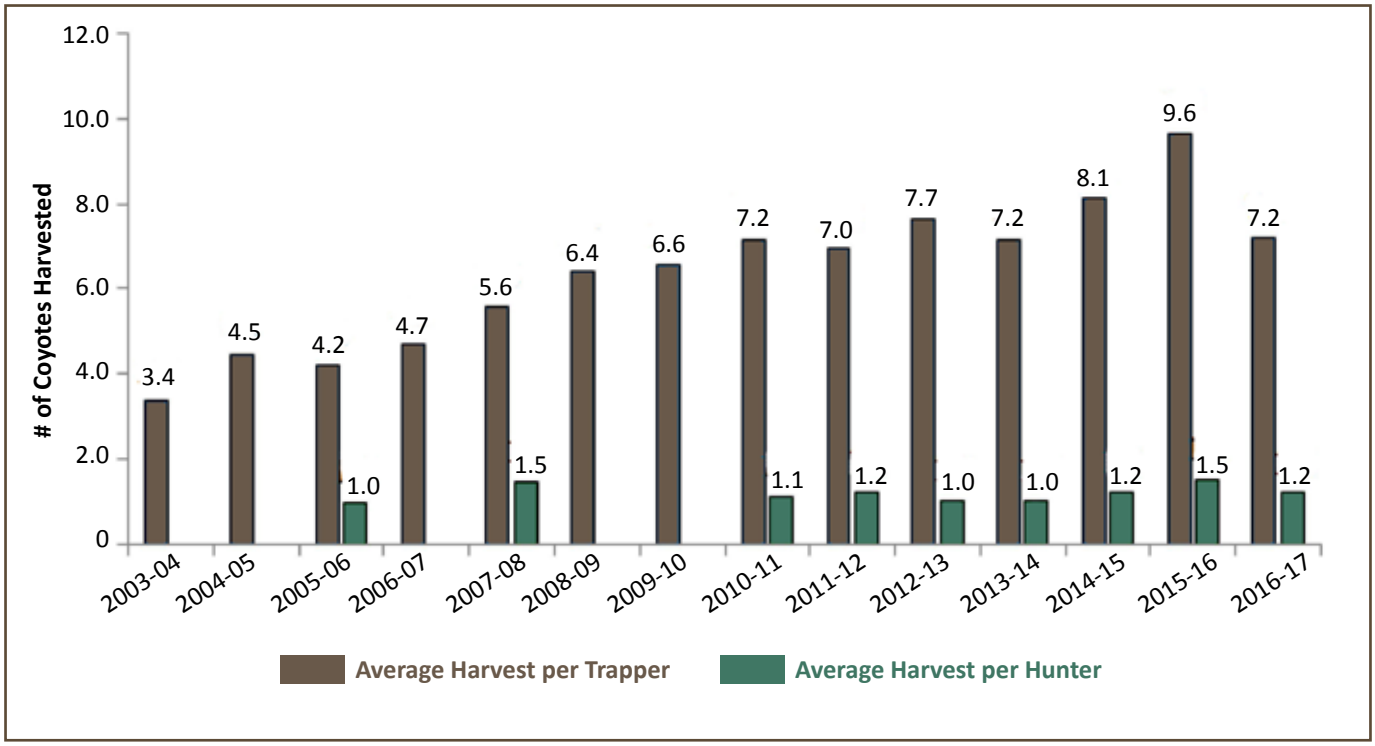

Figure 13. Average number of coyotes harvested by hunters and trappers from 2003 through 2017 in North Carolina. Note: No hunter data available for 2003-05, 2006-07, and 2008-10.

Currently, only the NC General Assembly has the authority to allow fox trapping in a county through passage of a session law, commonly referred to as "local law." Red and gray foxes are currently classified in statute as game animals rather than both game and furbearers as are bobcat, opossum, and raccoon (NCGS § 113 291.4). Because trapping is not a legal manner of take for game species (NCGS §113 291.1), the Commission may not set regulations to allow foxes to be taken by trapping within the regulated trapping season.

Over the past 40 years, the NC General Assembly has established numerous session laws relating to both the trapping and hunting of foxes. Many of these laws apply only to a specific county, multiple counties, or parts of counties. The diversity of these local laws has resulted in 27 fox hunting seasons with weapons in 85 counties, and 23 fox trapping seasons in 43 counties. The resulting complicated matrix of fox hunting and trapping seasons leads to confusion for hunters and trappers regarding to what is and is not legal. The Commission produces and publishes an online document to assist hunters and trappers on this topic (Appendix F).

Controlled Hunting Preserves: A "Controlled fox and coyote hunting preserve" is defined by NCGS §113-273 (g) as an area enclosed with a dog-proof fence on which foxes and coyotes may be hunted with dogs only. There are two types: those operated for private use, which may be of any size, and those operated for commercial purposes, which must be not less than 500 acres or of such size as set by regulation of the Commission. An annual operator license must be purchased for $50.00.

Table 4. Reported trapper harvest of coyotes by counties with and without a fox trapping season[1] in North Carolina and the percent difference in harvest between these counties, 2006-2016.

Year	Fox Trapping Season[1]	Coyote Harvest Per County	% Difference
2015-16	No (59 Counties) Yes (41 Counties)	47.1 75.6	+61%
2014-15	No (59 Counties) Yes (41 Counties)	33.3 51.7	+55%
2013-14	No (62 Counties) Yes (38 Counties)	30.0 53.5	+78%
2012-13	No (62 Counties) Yes (38 Counties)	25.8 55.8	+116%
2011-12	No (62 Counties) Yes (38 Counties)	24.7 50.3	+104%
2010-11	No (64 Counties) Yes (36 Counties)	21.9 39.1	+79%
2009-10	No (61 Counties) Yes (39 Counties)	14.4 30.5	+112%
2008-09	No (62 Counties) Yes (38 Counties)	15.6 20.5	+31%
2007-08	No (63 Counties) Yes (37 Counties)	11.5 19.7	+71%
2006-07	No (67 Counties) Yes (34 Counties)	7.0 10.8	+54%

[1] Fox trapping seasons are legislated through the North Carolina General Assembly.

The trapping and holding of live foxes and coyotes for sale to licensed controlled hunting preserves are allowed under NCGS §113-273 (g). There is little to no data about the numbers of coyotes moved into controlled fox hunting preserves or the source locations from which they are obtained (noted in Knowledge Gaps and Research Priorities). However, Commission biologists do not believe the number of coyotes removed from the landscape for the purpose of stocking hunting preserves has an impact on the numbers of animals in the statewide wild/free-ranging population. Currently, the value of a live coyote is higher than that of a pelt and certainly provides an economic incentive for trappers to pursue coyotes. It is illegal to import live coyotes into NC for release into controlled shooting preserves.

Depredation Permits: Under authority of NCGS §113 274(c)(1a), any landowner experiencing property damage may receive a depredation permit to allow coyotes to be trapped outside of the regulated trapping season. Depredation permits may be issued in circumstances where property damage or overabundance has been demonstrated. Livestock and poultry owners may receive a depredation permit upon request for coyotes only. When experienced trappers are used, depreda-

Table 5. Reported trapper harvest of coyotes prior to and after a fox trapping season was implemented or extended within a county by the North Carolina General Assembly, 2004-2014[1].

County	Average Coyote Harvest Before Fox Season[2]	Average Coyote Harvest After Fox Season[2]	% Change
Alleghany	11	20	+94%
Alamance (year 2006[3])	6	17	+187%
Alamance (year 2008[4])	17	46	+168%
Ashe	3	24	+741%
Craven	12	44	+255%
Davidson	1	15	+2533%
Johnston	1	35	+3087%
Person	1	13	+167%
Surry	14	63	+348%

[1] No new counties with fox trapping seasons until the 2015-16 season.
[2] Same number of years used to compare average coyote harvest before and after a fox season was implemented (e.g., 2 years before and 2 years after). No coyote trapper harvest data was available by county prior to 2004-05.
[3] In 2006, Alamance County changed from a 22-day fox trapping season in January to an Oct. 1 through Jan. 31 fox trapping season.
[4] In 2008, Alamance County changed from the Oct. 1-Jan. 31 fox trapping season to a June 1 through Feb. 28 fox trapping season. The Commission does not recommend the trapping of native species during breeding and is not recommended for native species due to impacts on recruitment and animal welfare concerns of trapping in summer heat.

tion permits can allow the targeted removal of individual problem coyotes, while reducing the indiscriminate capture of non-target species (e.g., dogs, bobcats, foxes, raccoons). In addition, depredation permits can also allow the use of a Collarum™-type trap (a unique cable restraint trapping device) for trapping coyotes. If a permit holder uses a Collarum™-type trap, s/he must submit specific reports provided by the Commission.

Either the Commission or a Wildlife Damage Control Agent may issue depredation permits for damage, and the Commission can issue depredation permits for overabundance. Landowner reporting under depredation permits is only required for bear, deer, wild turkey, alligator, elk, Canada geese, coyotes taken with a Collarum™-type trap, and coyotes taken within the five-county Albemarle Peninsula; for all other species (including coyotes) reporting is voluntary. Wildlife Damage Control Agents are required to report numbers of all species taken as part of their services. While approximately 13%

of landowners do voluntarily report activity under the depredation permit, most of our known coyote take under depredation permits is from Wildlife Damage Control Agents. Depredation permits and coyote removals has varied over the past 15 years (Figure 14). On average, Wildlife Damage Control Agents take 1.5 coyotes per depredation permit issued to a landowner. Most of the depredation permits issued by Wildlife Damage Control Agents and the Commission are in the Piedmont region, where both human population densities and complaints are highest, followed by the Coastal Plain and Mountain regions (Figure 15, page 37).

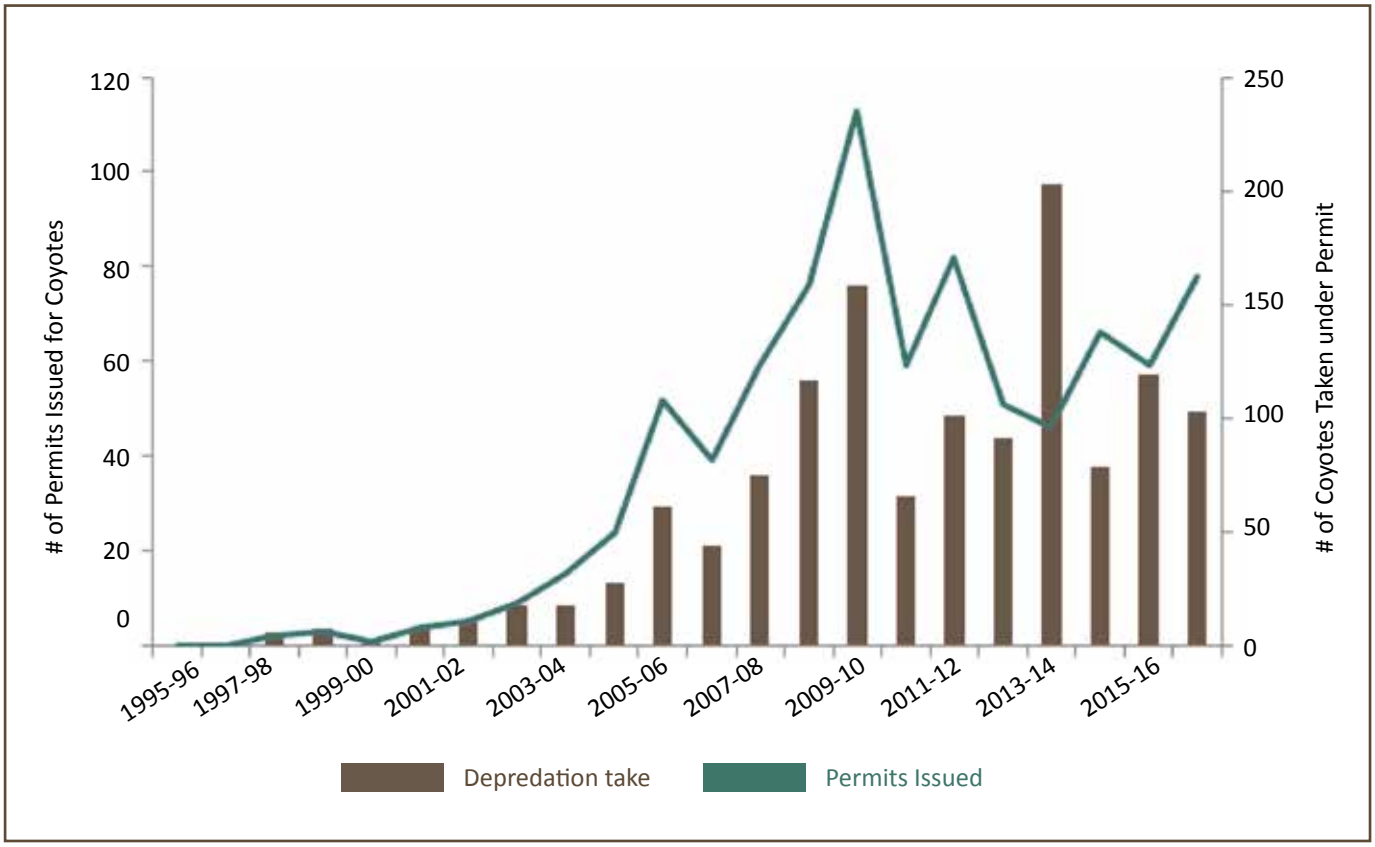

Figure 14. Number of depredation permits issued by WDCAs and the Commission, and the reported take of coyotes under those permits from 1995-96 through 2016-17. Note: Permits can allow for take of multiple animals.

Wildlife Damage Control Agents: Wildlife Damage Control Agents are individual citizens or employees of animal damage control companies that are trained and certified to issue Commission wildlife depredation permits to landowners with confirmed wildlife damage problems. Wildlife Damage Control Agents are only allowed to issue permits for certain species and cannot charge a fee for issuing a permit. However, they can charge for services they provide (e.g., site visit evaluation or capture and removal of the problem animal).

To assure that Wildlife Damage Control Agents are knowledgeable and competent, they are required to complete a Commission course that teaches the rules and regulations of the Wildlife Damage Control Agent program, and hunting, trapping, and deposition of wild animals. Information is also provided on euthanasia, safe handling of wildlife, professional-

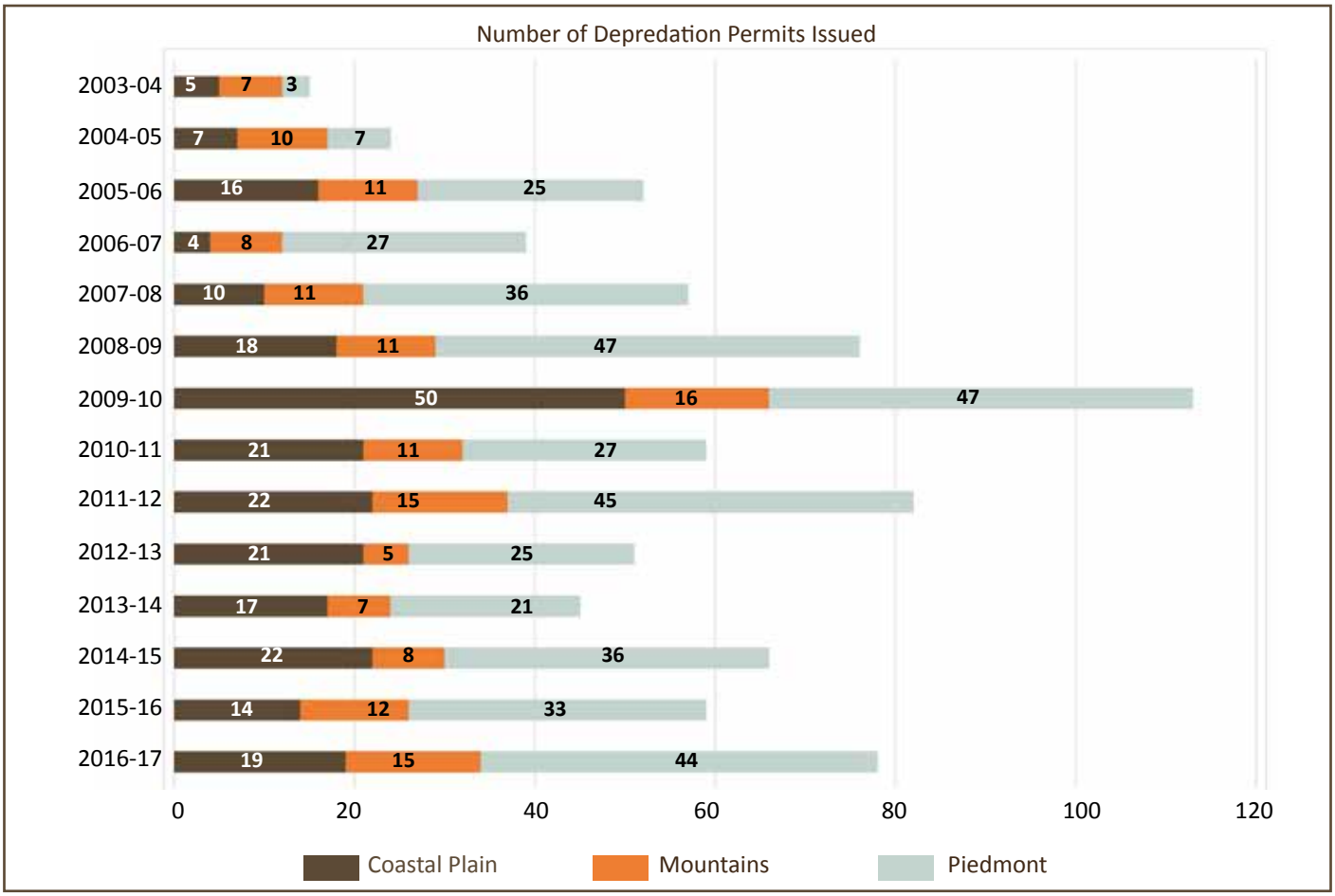

Figure 15. Number of depredation permits issued by Wildlife Damage Control Agents and the Commission in each of the fur-bearer management regions.

ism, wildlife diseases, trapping methods, and a variety of other information useful for Wildlife Damage Control Agents. Agents must pass a closed book certification examination and a background check prior to being certified.

Certification must be renewed every three years. To provide more options and increased professional development opportunities for recertifying Wildlife Damage Control Agents, an agent can now complete one of many training options during the 12 months prior to the expiration of their certification. These options include species-specific trapping workshops, including coyote trapping workshops offered by the North Carolina Trappers Association. The current list of options is available on our website: www.ncwildlife.org/WDCA/Classes-and-Certifications.

The public can locate a certified Wildlife Damage Control Agent in their county through a portal on the Commission website (www.ncwildlife.org/Trapping/Wildlife-Damage-Control-Agent). There are currently 589 active Wildlife Damage Control Agents in North Carolina.

Trapper Referral List: The Commission annually compiles a list of licensed trappers who offer to assist the public during the trapping season (November through February) when they experience problems with certain wildlife species (http://www.ncwildlife.org/Trapping/Contact-a-Licensed-Trapper; Figure 16). Trappers will likely do it for free or at a very reduced cost, since they can recoup their expenses by selling the fur of the animal.

By resolving conflicts with wildlife during the trapping season, the trapper can utilize the animal as a valuable natural resource, because this is the time of year when an animal's fur is prime. To become a listed trapper, licensed trappers must offer to be included in the list by completing the annual state trapper harvest survey which is sent to them at the end of the trapping season.

Currently, there are 1,214 licensed trappers that are willing to assist the public with coyote trapping listed on the Commission's website portal. Trappers are available in 99 of 100 NC counties.

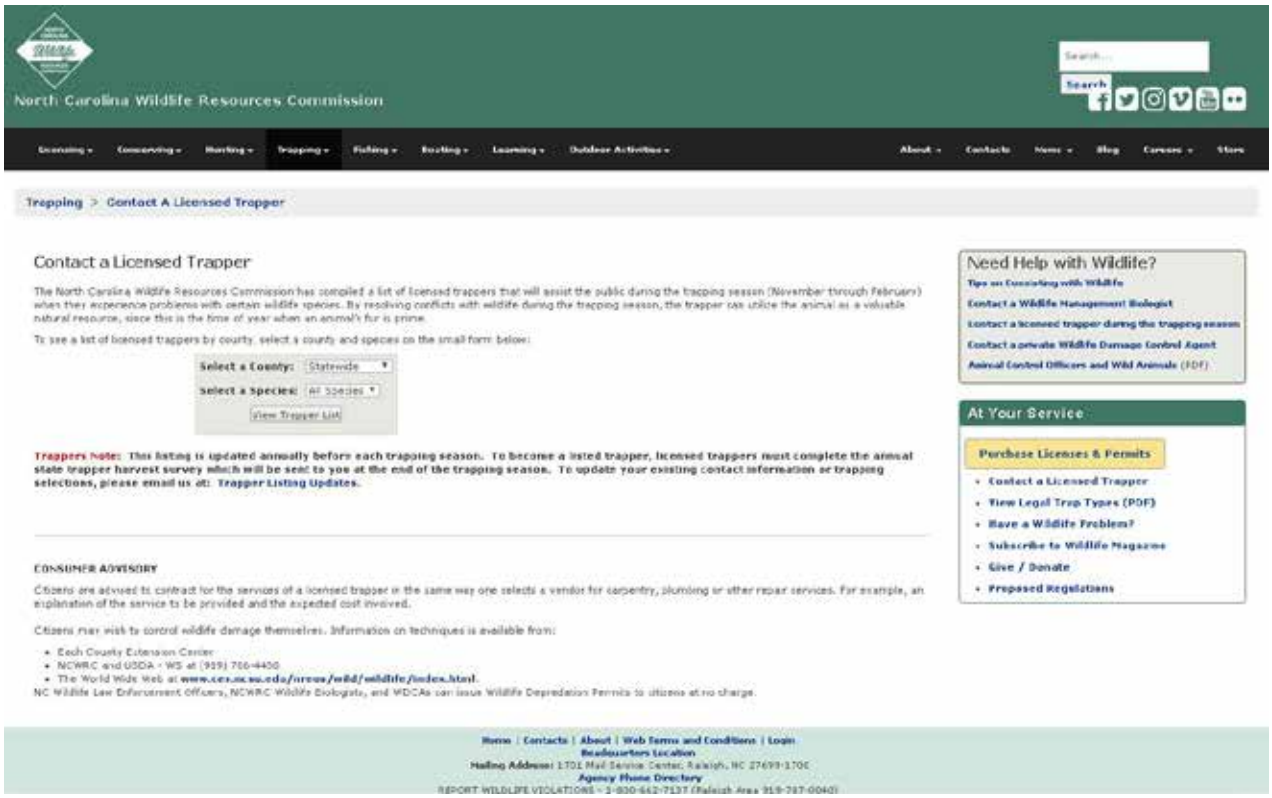

Figure 16. The web portal that allows the public to select their county and the species of interest in order to find a licensed trapper.

Trapper Education: The Commission, in cooperation with the North Carolina Trappers Association, offers basic trapper education courses through our Advanced Hunter Education Program. The current trapper education program consists of an online training program followed by a four-hour field day component. The Association of Fish and Wildlife Agencies trapper education manual is used for the course and was designed to assure that content taught to students was consistent among state agencies, despite differences in trapping regulations. This is a similar method used by state hunter education programs. While trapper education is not required in North Carolina, it is recommended for both novice and experienced trappers, and is required in many other states. The course covers skills, regulations, and the role of trapping in scientific wildlife management. It also teaches basic trapping techniques with a strong focus on the responsible treatment of animals, legal methods, safety, selectivity and ethical trapper behavior. The course was developed to 1) protect the health, safety, and welfare of people, wildlife, and domestic animals, 2) support wildlife conservation programs that sustain spe-

cies and ecosystems for the benefit of future generations, and 3) increase the benefits society currently receives from regulated trapping activities.

Other trapper educational opportunities are offered by the North Carolina Trappers Association that include species-specific trapping workshops, such as coyote and beaver. These workshops offer in-depth training and allow students to set traps and run a live trapline. In order to encourage Wildlife Damage Control Agents to become more proficient at targeting certain species, the Commission allows these workshops to qualify for recertification.

The current trapper education program consists of an online training program followed by a 4-hour field day component. (Photo: Colleen Olfenbuttel)

Coyote Management on the Albemarle Peninsula

The counties of Dare, Tyrrell, Hyde, Beaufort and Washington are referred to as the Albemarle Peninsula (AP). This area is designated as the red wolf (*Canis rufus*) recovery area by the US Fish and Wildlife Service, and, consequently, regulations for coyotes on the AP differ from the rest of the State. A detailed overview of rules and rulemaking regarding canids on the AP can be found in Appendix H. Currently, lethal management options available in other areas of North Carolina are restricted on the AP. To take coyotes by hunting on private lands on the AP, a "Coyote Hunting Permit" from the Commission is required. Trapping coyotes during the regulated trapping season (December 1 through end of February in AP counties) is not restricted. As in other areas of North Carolina, a depredation permit is required for the taking of coyotes by traps outside the regulated trapping season. In the future, the Commission will continue to work with the USFWS to address regulation of coyotes on the AP.

Albemarle Peninsula Coyote Hunting Permit: The Coyote Hunting permit is required in addition to a hunting license (if required). There is no closed season but hunting is restricted to the hours of one-half hour before sunrise until one-half hour after sunset. There is no bag limit on coyotes, and hunters may use electronic calls. Coyote hunting on public lands is prohibited, except coyotes may be taken on state-owned game lands by the holder of a Coyote Hunting permit and a Commission-issued permit for specific permitted hunt opportunities for coyotes. Permit holders must report the take of coyotes to the Commission within 24 hours of killing each individual coyote. Each report must include the date; time; location; whether a radio transmitter was present on the animal; and measurements of hind foot length and tail length taken from the carcass. Coyote hunting permits are valid for one calendar year and subject to renewal. Permit holders must submit their harvest reports to be eligible for permit renewal.

Albemarle Peninsula Coyote Depredation Permits: Under a depredation permit, coyotes may only be taken from the hours of one-half hour before sunrise until one-half hour after sunset with legal weapons. Only trapping is authorized at night. All individuals exercising the authority granted by the coyote depredation permit shall carry a copy of the coyote depredation permit. If traps are used they must be labeled, as required by North Carolina statute, checked daily and any animals caught therein must be removed. Any coyote taken under a depredation permit on the AP must be reported to the

Commission within 24 hours. All non-target wildlife must be released immediately onsite; however, any red wolf that is captured must be released onsite unless the U.S. Fish and Wildlife Service authorizes otherwise. All coyotes euthanized must be disposed of in a sanitary manner. Each depredation permit has an expiration date or time after which the depredation permit is no longer valid.

V. Recommended Statutory Changes

It is important to recognize that there are no statutory "silver bullets;" that is, statutory changes that will reduce the abundance of coyotes on the landscape. However, there are potentially statutory changes that could increase the harvest of coyotes.

Regulation of Manner of Take

In general, traps and other methods of legal take in NC have been established in statute for over 30 years. As previously noted in the Plan, significant advancements in trapping techniques and equipment have occurred since that time. Giving the Commission authority to regulate all manner of take more flexibly, including trap types (e.g., footholds, snares, etc.), would enable the Commission to reduce complexity regarding legal take. Additionally, through the regulatory process, the Commission could more rapidly respond to advancements in equipment technology and address public needs with regard to taking coyotes. Finally, this change would allow the Commission to consider the use of equipment, traps and trapping systems that have been proven to be effective and humane.

Changes needed include:

1. Amend NCGS §113.291.1 and § 113.291.6 to give the Commission authority to regulate the use of all gear types used in hunting and trapping.

Other Regulatory Considerations

Coyote management is complex and is made even more so with other canids (e.g., foxes) that have different statutory status (i.e., coyotes are wild animals while foxes are only game animals) on the landscape. While the Commission has authority to set seasons on coyotes, only the North Carolina General Assembly has authority to establish hunting and trapping seasons for foxes. As a result, fox hunting and trapping seasons vary substantially across our state (Appendix F). As outlined above, coyote harvest via trapping increases when trappers may harvest both coyotes and foxes. However, the Commission recognizes the complexity associated with the comprehensive management of canids in North Carolina and believes that constituent (e.g., hunters, trappers, and Controlled Fox Hunting Preserve operators) input is critical to ensure that all interested parties are at the table informing the best path to examine this issue.

Before implementation of regulatory or statutory change much of the subjectivity in the current dialogue must be removed by developing a structured decision-making process that includes formalized adaptive feedback mechanisms for all changes. To this end, the Commission will initiate a stakeholder engagement process through which stakeholders can collaborate on cooperative approaches to management of foxes and coyotes as recommended previously in the Commis-

sion's 2012 Fox and Coyote Study Report (Appendix E). Stakeholders will include relevant agencies, organizations, and constituents, including hunters, trappers, Controlled Fox Hunting Preserve operators, and non-profit organizations focused on conservation/wildlife/agriculture. This process will afford an opportunity to develop consensus on recommendations including regulatory and statutory approaches to improve the management of foxes and coyotes in North Carolina.

VI. Knowledge Gaps and Research Priorities

The Commission currently collects harvest data from hunters and trappers through annual surveys as well as data related to conflicts between NC citizens and coyotes. However, to effectively address statewide coyote management issues there are other monitoring and research efforts needed.

Area Specific Management

While coyotes are ubiquitous across the State, relative abundance varies, as does prey abundance and other food resources. With that in mind, we must determine if coyote management is best prescribed in zones, as opposed to statewide approaches and if so, how to optimize coyote management in zones with varying social and biological conditions. For example, issues regarding coyote management are very different between urban and rural areas. Understanding that management involves both lethal and non-lethal approaches, conflict resolution and management may differ due to local land use (e.g., agriculture, livestock, or recreation) and other factors. Continued use of social science to develop our understanding of the social dynamics of coyote management issues will be important in future management efforts.

Like our efforts to understand bears in the urban environment, research is needed to examine the ecology of coyotes in urban environments. Findings from such research can be adaptively integrated into coyote management approaches throughout the state.

Controlled Fox Hunting Preserves

North Carolina currently allows the establishment and operation of controlled fox hunting preserves for the purpose of training hounds and/or hunting foxes. Licensed preserves consist of fenced areas that meet certain statutory and regulatory requirements. While originally established primarily for the purpose of running foxes, coyotes are now legal to possess within these facilities. Trappers in NC can legally sell live coyotes to licensed operators for release into these enclosures. There are scant data about the numbers of coyotes moved into controlled fox hunting preserves or the source locations from which they are obtained. The Commission has contracted with the Wildlife Management Institute to perform a comprehensive review of the regulations and impacts of Controlled Fox Hunting Preserves as a part of the Periodic Review of Rules.

Impacts on Other Wildlife Species

Of concern to many is the impact coyotes may be having on game species populations, especially deer and wild turkey. To examine this issue research must examine both the predator and the prey populations. The Commission is currently designing deer and wild turkey research projects that will examine large-scale predation impacts and other issues. Parts of these statewide studies will address the influence of predation by coyotes and other predators (e.g., domestic dogs, bob-

cats, and bears). This research should help in making landscape-level habitat and game management recommendations versus using indiscriminate harvest, bounties, and incentive programs to attempt achieving game population objectives. Additionally, it will provide information specific to NC for development of site specific recommendations for managers/ landowners regarding habitat and harvest management strategies.

Estimation and Modeling of Populations

While not necessary to manage the species, requests for a population estimate or questions such as "how many coyotes do we have" are common. Currently, no viable method exists to estimate coyote populations either at a small or large scale. Development of a population estimation model that is sufficiently sensitive to be applicable across the state would be valuable to wildlife management. It is also imperative to continue our harvest surveys as these data will likely be a principle component of any potential model.

Disease Monitoring and Management

Diseases can be important in managing coyotes and other species that may be susceptible to diseases they carry, so development of a health monitoring strategy is important. Because coyote distribution and ecology are inextricably linked to human ecology, we must develop approaches to monitoring coyote health as it relates to changes in human population and habitat modification.

Commission Research on the Albemarle Peninsula

In 2013, the Commission and US Fish and Wildlife Service established a committee to oversee the collaborative management and conservation of sympatric canids (two or more species of wild canids existing in the same geographic location at the same time) on the Albemarle Peninsula. A US Fish and Wildlife Service and Commission joint memorandum documented detailed action items for this collaborative management, including specific research objectives. As part of the joint management agreement, the Commission is initiating a pilot project to begin addressing components of these research objectives.

As sympatric canids on the Albemarle Peninsula increase in number, monitoring their movements, particularly in relation to individuals of differing ancestry, could provide important data to Commission and US Fish and Wildlife Service staff for science-based local and landscape-level decisions about sympatric canid populations and conflict management. Collection of finer temporal scale location data would help to manage interactions of sympatric canids with humans, as well as to support development of dynamic stochastic population models.

Goals for this research include:

1. Using GPS collar and proximity sensor technology to test performance under various conditions and evaluate the frequency and accuracy of the scheduled fix rates.
2. Using fine scale GPS data collection for investigating annual and seasonal spatial dynamics of sympatric canids: home range and core area sizes, amount of overlap in home range and core areas, movement pathways and daily activity patterns, and cover type selection and preference.

3. Using fine scale GPS data collection for investigating the number and age structure of offspring for family groups of collared sympatric canids.
4. Using fine scale GPS data collection for investigating sources of mortality for sympatric canids.
5. Using fine scale GPS data collection for preventing and mitigating canid conflicts with landowners.
6. Determining genetic profiles of sympatric canids through DNA identification of all captured individuals, parentage, and presence of hybridization.

VII. New and Expanded Strategies

Numerous strategies and efforts are currently employed in NC to address coyote issues and concerns, but opportunities for new efforts exist. Developing new strategies and expanding some existing ones may enhance efforts at proactively addressing many current and future coyote issues and provide greater public service to the citizens of the State.

Increase Promotion of the Trapper Referral Program

There are currently 1,214 licensed trappers that have provided their contact information to the public to assist in trapping coyotes during the regulated trapping season. However, public and private landowners are often unaware of this referral program. Improvement of outreach and marketing efforts of these, often free, trapping services is needed to make them more accessible to the public.

Create a Coyote Hunter Referral Program

While trapping coyotes is an efficient tool for removing coyotes, hunting can be another tool. In particular, coyote hunters specifically target coyotes using various techniques and equipment not used by average hunters. Connecting coyote hunters with landowners would provide assistance for landowners, while increasing hunting access opportunities for coyote hunters.

Develop New Strategies that Target Specific Animals Causing Problems

Work with constituent groups such as the North Carolina Trappers Association, Wildlife Damage Control Agents and others to educate the public about the habits of predators and successful hunting and trapping techniques, developing skills-based training to teach successful techniques, and social-media driven outreach to link persons with predator problems to those persons willing to assist in removing targeted individuals or species on targeted landscapes.

Enhance Educational Materials Regarding Coyote Management

Substantial information exists regarding coyotes and coyote management; however certain actions are needed to improve content and delivery of that information. Efforts to improve, expand, and unify the message include:

- Distribute and/or make readily available all current coyote management and regulation educational materials produced by the Commission.
- Develop a brochure that clearly outlines landowner's legal rights (including use of lethal tools) to address coyotes on their property.

- Create recommendations and outreach materials to guide the public on when coyote removal is appropriate and effective based on the objectives of the property owner.
- Develop a new rack card and door hanger reviewing basics of preventing and addressing coyote problems for use in communities where coyote concerns/problems are occurring.
- Create materials that have recommendations on how landowners can increase wildlife populations on their properties.
- Ensure all guidance for trapping of coyotes to Wildlife Damage Control Agents, licensed trappers, depredation permit holders, and landowners promotes trapping Best Management Practices.

Delivery Methods to Increase Public Knowledge and Awareness

Getting accurate information to those who need it remains a challenge. Action items to maximize delivery of information to increase public knowledge and awareness include:

- Expand the coyote management workshop series to target smaller geographic and demographic areas of the State.
- Develop a standard coyote management presentation and train Commission staff across divisions.
- Improve the Commission website and incorporate coyote management messaging into Commission social media efforts.
- Develop a short-form video series with topics such as coyote biology, coyote trapping, coyote hunting, and preventing problems with coyotes and share with partners.
- Promote proactive stories about coyote management tools to the media through press releases and relationship building with local media outlets.
- Work with the Commission's Hunter Education Program to develop educational resources about coyotes for certified volunteer instructors and for hunters.
- Work with NC Cooperative Extension to develop and share resources and provide training to their staff as needed to maximize outreach efforts to the public.
- Promote the local NC Cooperative Extension offices as hubs for local citizens to obtain information specifically related to coyote biology and management, and connect the citizens with appropriate professionals to address their needs.

Distribution and Availability of Materials to the Public

Expanding understanding and awareness of coyotes and successfully addressing coyote issues at appropriate scales requires a partnership approach between the Commission and a wide range of other governmental and non-governmental entities. Each partner is closely connected to a unique group of the State's citizenry and each group often has different specific concerns about coyotes that are most important to them (i.e., cattle owners vs. urban house cat owners). Additionally, these partners have an established relationship and creditability with their constituency. Developing or intensifying relationships with partners will both increase the delivery of accurate and consistent information and maximize its acceptance and use by the public.

Examples of organizations where partnerships currently exist, can be enhanced, or should be developed include but are not limited to:

- NC Cooperative Extension,
- Natural Resources Conservation Service,
- NC Soil and Water Conservation Districts,

- State and County Cattlemen's Associations,
- NC Farm Bureau,
- Non-profit Organizations focused on conservation/wildlife/agriculture,
- NC Sheep Producers Association,
- NC Trappers Association,
- NC Predator Hunters Association,
- NC Animal and Rabies Control Association,
- NC Wildlife Damage Control Agents, and
- US Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services.

Continue and Expand Surveys of Citizens

The Commission should continue to survey the public to understand how education and outreach efforts may influence behaviors, prevent/address coyote problems, and promote tolerance and coexistence with coyotes.

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Appendix A. Report to the Environmental Review Commission on Coyote Management

Report to the Environmental Review Commission on Coyote Management

March 1, 2016

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

March 1, 2016

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

Honorable Chuck McGrady
N.C. House of Representatives
300 N. Salisbury Street, Room 304
Raleigh, NC 27603-5925

Senator Trudy Wade
N.C. Senate
300 N. Salisbury Street, Room 521
Raleigh, NC 27603-5925

Honorables:

The 2015 General Assembly directed the North Carolina Wildlife Resources Commission (WRC) to establish a coyote management plan to address the impacts of coyotes in North Carolina. I am submitting this report to the Environmental Review Commission in fulfillment of the requirements of Section 4.35.(a) and Section 4.34.(a) of Session Law 2015-286 (H765). As directed in statute, this report provides initial findings and recommendations by the North Carolina Wildlife Resources Commission to address overpopulation of coyotes in North Carolina. This report also outlines the progress of the established pilot coyote management assistance program in Mitchell County.

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 Wildlife Resources Commission 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 was directed to report its findings and recommendations, including any proposed legislation to address overpopulation of coyotes, to the Environmental Review Commission by 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 must 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.

WRC was directed to submit an interim report on the progress of the pilot program to the Environmental Review Commission by March 1, 2016. A final report on the results of the pilot program, including any proposed legislation, shall be submitted to the Environmental Review Commission by January 1, 2017.

Legislation

SESSION LAW 2015-286 (HOUSE BILL 765)

SECTION 4.34.(a) The Wildlife Resources Commission shall establish a coyote management plan to address the impacts of coyotes in this State and the threats that coyotes pose to citizens, industries, and populations of native wildlife species within the State.

SECTION 4.34.(b) The Wildlife Resources Commission shall report its findings and recommendations, including any proposed legislation to address overpopulation of coyotes, to the Environmental Review Commission by March 1, 2016.

SECTION 4.35. (a) The Wildlife Resources Commission shall establish a pilot coyote management assistance program in Mitchell County. In implementing the program, the Commission shall 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.

SECTION 4.35. (b) The Wildlife Resources Commission shall submit an interim report on the progress of the pilot program to the Environmental Review Commission by March 1, 2016. The Wildlife Resources Commission shall submit a final report on the results of the pilot program, including any proposed legislation, to the Environmental Review Commission by January 1, 2017.

Background

Coyote Description and Biology

Coyotes have pointed and erect ears, and long slender snouts. The tail is bushy and black-tipped and is usually carried pointing down. Their color is typically dark gray, and can range from blonde to black. Adults are typically the size of a medium-sized dog and average between 20 and 45 pounds although larger animals have been documented. In many parts of the U.S., including N.C., coyotes may be mistaken for dogs or wolves, and the existence of both dog-coyote hybrids and wolf-coyote hybrids can make identification difficult. Coyotes feed on a wide variety of food sources, depending on what is most readily available and easy to obtain. Coyote foods sources include fruit, berries, pet food left outside, small mammals (voles, rats, and mice), deer, carrion, rabbits, birds, snakes, frogs, insects, etc. Coyotes can also prey on livestock and domestic pets. Coyotes have an important ecological role in nature as an apex predator, maintaining prey species numbers at bay.

Coyotes typically mate for life and breeding occurs from January through early March. Pups are born in March and April and the typical litter size is six to eight pups. As a highly adaptable species, coyotes can increase the number of pups per litter when stressed, this is called compensatory reproduction and it usually happens when a high number of coyotes is removed from the landscape. This specific compensatory trait should be considered when implementing coyote management strategies. In areas where intense coyote harvest occurs, a temporary reduction in coyotes may occur, but this result may be short-lived because coyotes can respond by producing larger litters. Additionally, individuals born in other areas may disperse large distances in search of new home ranges, and replace removed dominant animals. Surprisingly, when as much as 60% of the coyote population is removed from an area, the population can recover within a year. Even if 90% of coyotes are removed, the population can recover in 5 years.

Family units usually begin to disperse by late November or December. Dispersal rates are high and dispersal distances can be extensive; records show that some coyotes in North Carolina have dispersed more than 200 miles in just a few months. Coyotes are territorial and actively defend their home ranges. These home ranges can vary between 1,000 and 16,000 acres depending on season, habitat, presence of other predators, and food availability. Coyote habitat ranges from agricultural fields to forested regions and suburban neighborhoods. Coyotes usually dig their own den, but they will sometimes enlarge an old animal hole or use a natural hole in a rocky ledge as a den. Dens are usually hidden from view and used by coyotes to birth their young and sleep.

When an individual coyote or family group leaves or is removed, new coyotes will usually move into the vacated territory. These territories frequently overlap with one or more transient coyotes that are searching for a mate or their own territory. The transient nature of the population makes estimating the number of coyotes in a particular area difficult, which, in turn, makes controlling coyote populations difficult. Coyotes are often wary of people and will avoid areas in which threats are perceived. In some cases coyotes can become acclimated to humans in the absence of threats, and in areas where unnatural food sources, such as pet food and garbage are readily available.

Coyote Distribution

Prior to the 1800s, coyotes occupied the prairies and grasslands of the Midwest. However, changes in habitat and predator prey dynamics have allowed the expansion of coyotes across the United States.

Extensive efforts have been devoted to controlling coyotes across the United States. Despite these extensive control attempts coyotes have continued to expand their range. The coyote is North America's widest ranging wild canid. A highly adaptable species, coyotes have thrived in a variety of landscapes, including urban environments.

The first reported sighting of a coyote in N.C. was in Gaston County in 1938. The first confirmed coyotes that were collected came from Johnston County (1955) and Wake County (1970). Prior to 1983, North Carolina had only sporadic instances of coyotes mostly on the coastal plain; these coyotes likely escaped from captivity or were released illegally for the purpose of hunting. The first coyotes believed to have naturally dispersed into North Carolina were detected in 1988 in the far western counties of the state. This natural range expansion from Tennessee, Georgia, and South Carolina likely occurred due to removal of other large predators (wolves and cougar) reducing competition, major landscape level habitat changes, including the creation of trails and roads, and an increase of novel food resources such as crops. By 2005, coyotes occurred in all 100 North Carolina counties.

Legal Status

Coyotes have no special protection in North Carolina and may be killed by any method that is not prohibited by federal, state, or local statutes. Currently there is no closed season for hunting coyotes in North Carolina. Electronic calls may be used and coyotes may be hunted at night, except on private lands in Beaufort, Dare, Hyde, Tyrrell and Washington counties. Coyote hunting in those counties is restricted to daytime only and requires a permit from the NCWRC. However, under authority of 15A NCAC 10B .0106 depredation permits may be issued by WRC for the taking of wildlife resources in circumstances of overabundance.

Trapping coyotes is allowed during any open furbearer trapping season and when any fox trapping season established by local law is open. Coyotes taken by trapping during these seasons may be sold to Controlled Fox Hunting Preserves, as established under GS 113-273(g). Further, any landowner wishing to control coyotes may receive a depredation permit from the NCWRC. There are no coyote bag limits of any kind (individual, daily, season, etc.) for trapping and hunting seasons. It is illegal to breed or import coyotes into North Carolina, as established under GS 113-294(o).

Commission Authority to Regulate Coyote Hunting – Coyotes are classified as wild animals (GS 113-129), but not game. Under this classification the Commission has the authority to set hunting seasons and bag limits (GS 113-291.2) and designate manner of taking, including the use of artificial lights and electronic calls (GS 113-291.1).

Commission Authority to Regulate Coyote Trapping – The Commission uses the same authority (GS 113-291.2) to set trapping seasons and bag limits as for hunting seasons. Trap types for wild animals are specified in GS 113-291.6. Trappers may trap coyotes under the authority of their trapping or hunting license.

Commission Authority to Issue Depredation Permits – The Commission has the authority (GS 113-274) to issue depredation permits to authorize the taking, destruction, transfer, removal, transplanting, or driving away of undesirable, harmful, predatory, excess, or surplus wildlife or wildlife resources. Livestock or poultry owners are issued a depredation permit for coyotes upon request. No depredation permit or any license is needed for the owner or lessee of property to take wildlife while committing depredations upon the property.

In the 2014-2015 hunting season, NC hunters harvested an estimated 43,507 coyotes. While some hunters do specifically hunt for coyotes, many coyotes are killed incidentally by hunters that are pursuing other species such as deer. North Carolina trappers successfully trapped an estimated 7,611 coyotes during the 2014-15 trapping season.

Table 1. Statewide coyote harvest estimates from hunter and trapper harvest surveys of North Carolina license holders.

Year*	Species	Estimated Statewide Hunter Harvest	Estimated Statewide Trapper Harvest
2005-06	Coyote	19,422	593
2006-07	Coyote	-	847
2007-08	Coyote	35,144	1,434
2008-09	Coyote	-	1,747
2009-10	Coyote	-	2,091
2010-11	Coyote	36,041	2,843
2011-12	Coyote	31,663	3,458
2012-13	Coyote	27,152	5,419
2013-14	Coyote	34,972	6,951
2014-15	Coyote	43,507	7,611

*Hunter harvest surveys were conducted intermittently prior to 2010.

North Carolina Coyote Management Plan

As stated, Section 4.34(a) of Session Law 2015-286 (House Bill 765) stipulates that "[t]he Wildlife Resources Commission shall establish a coyote management plan to address the impacts of coyotes in this State and the threats that coyotes pose to citizens, industries, and populations of native wildlife species within the State." Coyotes are now a statewide component of North Carolina's fauna. While intensive management of coyotes on individual or groups of properties can be successful, statewide perspectives on coyote management must recognize the variability and persistence of coyotes across the state and must be flexible and adaptive. Critical tenants of successful coyote management must be collaboration, and implementation to satisfy the desires of citizens across a wide variety of circumstances. Coyote

population management to satisfy the desires of North Carolinians and managing situations to minimize negative human-coyote interactions must be our goals and, therefore, the foundation of a statewide management plan.

Developing a Statewide Coyote Management Plan

The development of a statewide management plan for any species is a complex undertaking that addresses biological, social, economic, and political aspects of species management. Using coyote management efforts previously undertaken by the NCWRC as a foundation, we will expand efforts through development of a statewide coyote management plan (Plan). Approaches to developing the Plan, and elements therein, will address the biological, social, economic, and political aspects of successful coyote management. Developing the Plan requires that we explore and understand the attitudes, opinions, and desires of our citizens regarding coyotes, that we compile other currently available information about coyotes, and that we meld these considerations into a plan that collectively addresses stated goals. It is important to understand the real and perceived economic impact of human-coyote interactions and the cost associated with implementing a coyote management plan to assess its economic viability. Development of multiple aspects of the Plan will progress simultaneously. In order to address the requirements of Section 4.34(a), the NCWRC has established a team to draft a North Carolina Coyote Management Plan (Plan). The Plan will include:

- Evaluation of all available biological information on coyotes in North Carolina;
- Identification of knowledge gaps and additional research needed on coyote population dynamics, reproduction, habitat use, movements, social dynamics, impacts on other wildlife species, and impacts on humans;
- Recommendations for partnerships with other agencies and organizations to provide assistance and education to citizens about living with coyotes;
- Recommendations for biological and social strategies to address coyote management issues;
- Recommendations for any statutory and/or regulatory changes need to reduce or eliminate legal barriers to effective coyote management; and
- Recommendations on a framework for gathering public input on the North Carolina Coyote Management Plan.

Social Aspects of Coyote Management

Public opinion about coyotes can vary significantly across the state depending on a person's location, interests, and value systems. The NCWRC is currently collaborating with North Carolina State University, the U.S. Fish and Wildlife Service, and Mitchell County officials to conduct surveys in the Charlotte Metro Area, on the Albemarle Peninsula, and in Mitchell County to describe the perspectives of citizens in these areas about coyotes and their management. Building on these efforts and to provide information to build the Plan, the NCWRC will conduct public input meetings regarding coyote management. These public input meetings will be held in each of the NCWRC's nine administrative districts. Input from these meetings will be used to both inform initial development of the Plan and as a basis for a statewide survey of citizens to scientifically determine their attitudes and opinions regarding coyotes and their management. Results of these human dimensions surveys and research efforts will drive development of the goals and objectives of the Plan and will form a significant basis for the final recommendations. This work will proceed concurrently with developing other aspects of the Plan.

Coyote Monitoring and Research

The NCWRC currently collects harvest data from hunters and trappers through annual surveys. However, to effectively address statewide coyote management issues there are other monitoring and research efforts needed. First, we must determine if coyote management is best prescribed in zones, as opposed to statewide approaches. For example, issues regarding coyote management are very different between urban and rural areas. While coyotes are ubiquitous across our State, relative abundance varies, as does prey abundance and other food resources. With that in mind, we must determine how to optimize coyote management in zones with varying social and biological conditions.

With increasing coyote populations, we must determine if predation on game species is causing significant population impacts (e.g., reducing deer populations), and if so whether modifications are needed in harvest seasons for the game species. The NCWRC is currently designing research to address large-scale predation issues. Similar to our efforts to understand bears in the urban environment, we will initiate research to determine the ecology of coyotes in the urban environment. While this research will not be completed before completion of the Plan, we will structure recommendations in the Plan such that as they become available results can be adaptively integrated into coyote management approaches. We must continue our harvest surveys and use these data to propose development of a population estimation model that is timely and sufficiently sensitive to be applicable across the state. Diseases can be important in managing coyotes, and other species that may be susceptible to diseases they carry, so development of a disease monitoring strategy will be included in the Plan. We must learn more about the dynamics of coyotes that move into (or through) Controlled Fox Hunting Preserves and their impacts on other species within and outside the Preserves. Finally, because coyote distribution and ecology are inextricably linked to our human ecology, we must develop approaches to monitor changes in human population dynamics in ways meaningful to management of coyotes.

Legal Considerations Regarding Coyote Management

As a relatively recent addition to N.C.'s fauna, rules and laws related to coyote management continue to evolve. Currently there is no closed season for hunting coyotes in North Carolina and hunting with electronic callers and at night is also allowed, except on private lands in Beaufort, Dare, Hyde, Tyrrell and Washington counties (due to range overlap with the red wolf, coyote hunting is allowed during daytime only and requires a permit from the NCWRC). Trapping coyotes is allowed during any open furbearer trapping season and any open fox trapping season established by local law. There is no bag limit for taking coyotes whether by hunting or trapping. Any landowner may receive a depredation permit from the NCWRC to kill coyotes on their properties. Even with all these allowances for landowners to manage coyotes on their properties through legal take, there are many legal considerations regarding coyote management in our State. With that in mind, we will review all current rules and laws to clearly demonstrate the legal status of coyotes in North Carolina and how these legal mandates influence their management. Because coyote management is intertwined with fox management, we will also examine how fox management influences coyote management. Finally we will evaluate and recommend specific additional steps that can be taken by the NCWRC and/or the General Assembly to reduce or eliminate legal barriers to effective coyote management.

Education and Outreach

For many citizens coyote management centers on managing situations in which coyotes have been a nuisance or caused damage; for others, is the sole presence of coyotes that creates unease. There are many approaches to coyote management and these will be explored and fully explained in the Plan. In addition, in this section of the Plan we will inform and educate readers about living with coyotes, especially in urban or suburban areas. The NCWRC's Wildlife Damage Control Agent Program and collaboration with the N.C Trappers Association provide many options for landowners to seek assistance in managing coyote nuisance situations. These options and the options for developing an integrated predation management program (which could benefit management of many other species) will be fully explored in the Plan. There are many exemplary agencies and institutions in our State and we will explore expanding collaborations with Cooperative Extension and other entities.

Recommendations

To be successful, management efforts directed toward coyotes must be broad in nature and adaptable to change. Based upon constituent desires determined through our social research, information presented in the plan, and the range of potential research outcomes, we will present a list of coyote management recommendations for immediate implementation and for integration as increases in our knowledge and socio-political opportunities allow. The North Carolina Coyote Management Plan will be submitted to the NCWRC Commissioners for consideration for adoption by March 2018.

Establish a pilot Coyote Management Assistance Program (CMAP) in Mitchell County

The NCWRC established a working group to address the action items outlined in statute (Section 4.35. (a)). Initial action required meeting with representatives of the agriculture industry in Mitchell County to determine the most effective approach to meeting both the legislative and constituent needs related to coyote depredation on livestock.

Staff members with NCWRC held a meeting with Senator Ralph Hise, Mitchell county officials, livestock owners and livestock producers on November 30, 2015 in Mitchell County. The constituents in attendance clarified that property damage caused by coyotes in Mitchell County is primarily predation on livestock, and outlined immediate needs and potential solutions. The findings represent the foundation of the pilot coyote management assistance program.

During the initial discussions we identified the following needs:

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

Based on the identification of these needs, NCWRC is working cooperatively with NCSU Cooperative Extension to design a coyote management assistance program for Mitchell County. The program will include onsite technical guidance to landowners as well as a trapper referral program for Mitchell County.

The program will immediately place the landowner in contact with local wildlife professionals (most often NCWRC biologists) that can visit their property, assess the situation and provide immediate advice as necessary to address issues. The program will provide landowners with a consistent point of contact to reach dependable and capable individuals to assist with lethal removal of depredating coyotes such as licensed trappers, Wildlife Damage Control Agents and as necessary USDA-Wildlife Services or other wildlife damage services. Most coyote management services will require some fee for service. Current discussions with Mitchell county officials suggest a potential shared cost model between the landowner, county and state or an individual contract model between landowner and trapper with cost and incentives negotiated between the two entities.

Working cooperatively with USDA Wildlife Services, the North Carolina Trappers Association and potentially NCSU Cooperative Extension, NCWRC staff are developing Coyote Management and Trapping workshops to help educate and train individuals on the biology, management and control techniques available for coyotes. The workshops will be a combination of lectures and skills based training on the field.

To address education needs, NCWRC is working cooperatively with Mitchell County Cooperative Extension and Mitchell county officials to design and implement an educational outreach strategy to include informational packages to be made available at the County Extension office. In addition, NCWRC will partner with Mitchell County to provide informational programs at organized events to inform constituents about the availability of onsite technical guidance by NCWRC wildlife biologists. Onsite technical guidance will focus on coyote biology and how to minimize predation using lethal and non-lethal control methods as well as alternative husbandry practices.

Once established, the pilot program will allow NCWRC and Mitchell County Cooperative Extension to evaluate the effect of varying levels of control/prevention tools on livestock loss and livestock producer satisfaction and subsequently be able to pass that information along to producers when issues or problems arise.

Human Dimensions

Normally, coyotes are elusive animals that avoid direct contact with humans. Being most active after dusk and before daylight, they are typically seen only at a distance. In most areas of North Carolina, coyotes continue to behave in ways that minimize their contact with humans. The majority of citizens have little personal experience with coyotes which may influence their perceptions.

The wide range in perspectives about coyotes prompts the need to determine a fundamental understanding of the public's primary issues and concerns. Coyotes come into contact with humans in a variety of ways, from just crossing a street or a field in an urbanized area 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 problem and address the wildlife species causing the problem. Because coyote damage is often not observed by humans as it is happening, heavy reliance must be placed on indirect evidence at the damage site. It should be noted that not all coyotes develop predation tendencies on livestock and coyotes that scavenge livestock carcasses may be incorrectly blamed for the deaths of those animals.

Initial conversations at the November 30th meeting with Mitchell County livestock producers suggested that actual predation on livestock is currently limited. However, there is concern that coyote depredation will increase. Furthermore, attendees shared information about depredation suffered by other producers

in Mitchell County. To assess the damage occurring in Mitchell County, a scientific survey is currently being developed and will be sent to all registered livestock/poultry producers in the county. The survey will allow producers to report specific damage and losses attributed to coyotes in 2015. A concurrent survey will be sent to producers in a neighboring county with similar livestock statistics to provide a control group for the research associated with the pilot coyote management assistance program in Mitchell County.

In addition to the survey, NCWRC staff will work directly with the local Cooperative Extension office, landowners, and other livestock predation experts to develop a system that livestock producers can access to specifically 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 a reduction in loss due to predatory animals (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 methodology.

Coyote Control Methodologies

While coyotes have established a reputation for efficient and effective predation, the true extent and effect of coyotes preying on livestock is poorly documented in North Carolina. It is critical to understand coyote population dynamics and localized impacts is fundamental to developing statewide control methodologies. To determine the scalability of the pilot coyote management assistance program in Mitchell County, the NCWRC will have to obtain data from each region to account for differences in habitat, type of depredation occurring, and landscape characteristics.

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, has been discontinued by most instituting authorities because they are ineffective in reducing actual damage and lack of economic viability. For example, the North Carolina coyote harvest for 2014-15 totaled 51,118 individuals. 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. Killing individuals that are not causing damage can open territories for other individuals that have learned to depredate livestock or cause other damage.

Lethal removal of coyotes is not the only method available for reducing coyote damage, and in some circumstances it might be the least effective. Recommended non-lethal techniques for reducing coyote depredations on livestock include: confining or concentrating young or birthing livestock at 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. Several Mitchell County landowners and livestock producers stated that they currently use guard animals (donkeys and llamas), and that they currently have minimal issues with coyotes.

When non-lethal techniques do not deter depredations, targeted or selected removal of offending coyotes may achieve management objectives. Trapping is the most effective and efficient means for targeting and removing coyotes that are actively depredating livestock. Removing one or two offending individuals in a small area may stop the problem. Several Mitchell County landowners also indicated that they had used trapping to address coyote issues in the past with varying degrees of effectiveness.

Trapping coyotes requires knowledge and a skillset not necessarily possessed by the average individual. Well trained and experienced coyote trappers will be required to successfully remove problem animals without exacerbating the issue by causing the coyotes to become more difficult to trap due to poor technique.

Next Steps

The NCWRC will continue to develop and implement the pilot coyote management assistance program in Mitchell County with its partners. In addition, the NCWRC will also be collecting information required to determine the scalability of this program. A final report detailing the findings will be presented to the Environmental Review Commission by January 1, 2017.

Appendix B. Coyote Biology and Life History

Coyote Distribution

Prior to the 1800s, coyotes occupied the prairies and grasslands of the Midwest. However, changes in habitat and predator prey dynamics have allowed the expansion of coyotes across the United States. Coyotes took two paths to colonize the eastern United States (Figure 1). The northeastern path saw coyotes that had moved into the upper Midwest in the late 1800s, further expand into Canada during the early 1900s, New York and New England by the 1950s, and Pennsylvania and West Virginia in the mid-1970s (Moore and Parker 1992). The southeastern path documented coyotes in Arkansas by the 1920s, Alabama, Louisiana, Mississippi, and Tennessee by the mid-1960s, and Georgia, Florida, Kentucky, Maryland, North Carolina and South Carolina by the mid- to late-1980s (Moore and Parker 1992, Mastro 2011). In southeastern states, evidence shows natural range expansion by coyotes was supplemented by illegal importations for hunting purposes (Hill et al. 1987).

Figure 1. Coyote range expansion throughout the United States

Contrary to the widespread cultural myth, the NCWRC did not release coyotes into North Carolina. The first reported sighting of a coyote in N.C. was in Gaston County in 1938 (Figure 2). The first confirmed coyotes that were collected came from Johnston County (1955) and Wake County (1970). Prior to 1990, North Carolina had only sporadic instances of coyotes mostly on the coastal plain; these coyotes likely escaped from captivity or were released illegally for the purpose of hunting (Figure 3).

Figure 2. Observations and collections of coyotes from 1938 through 1978.

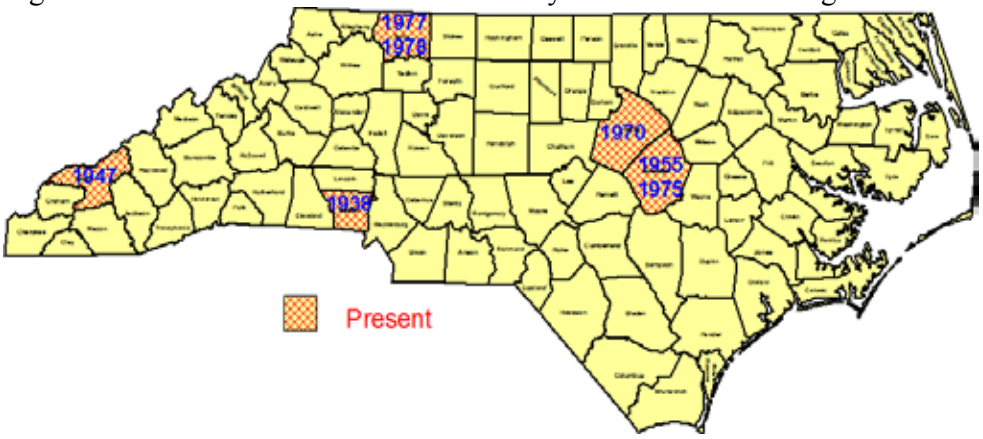
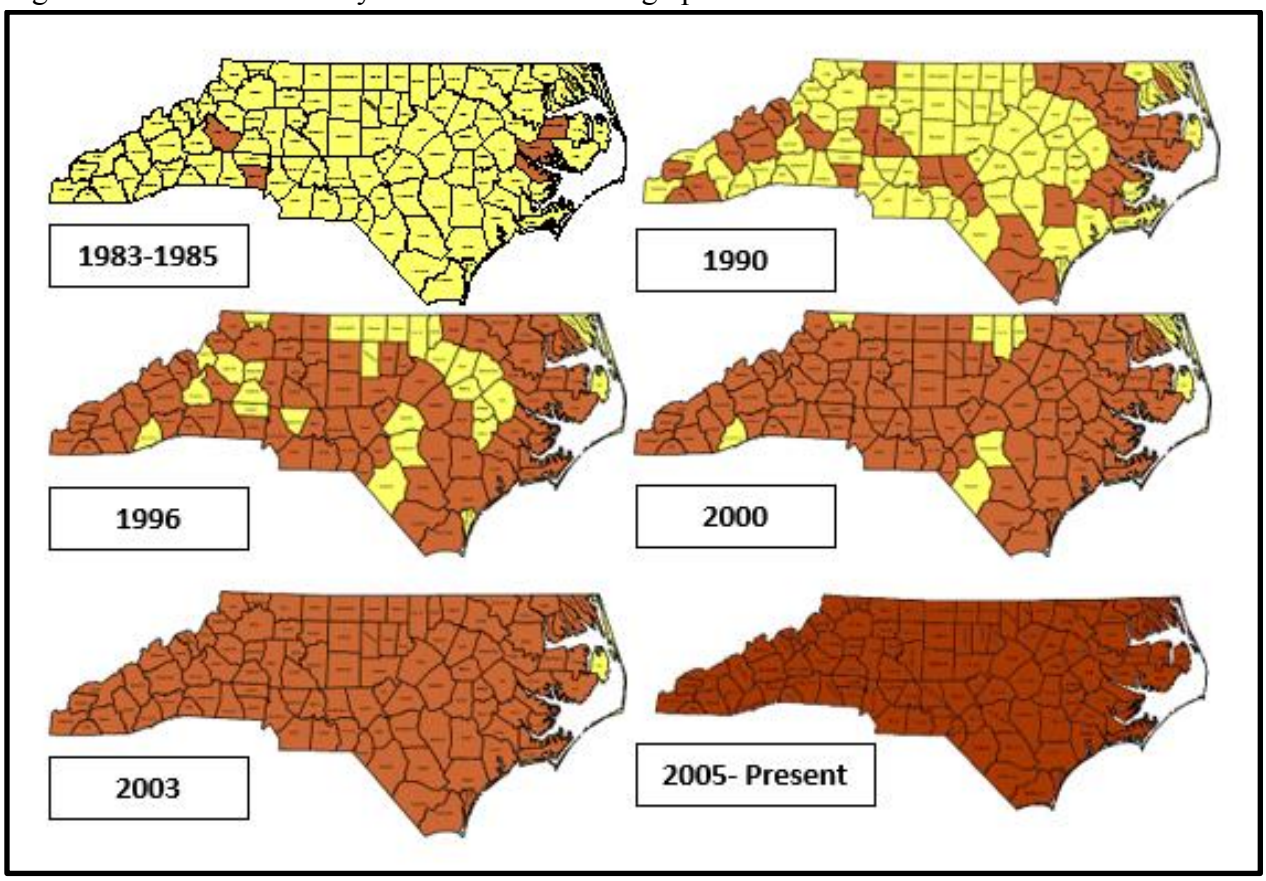


Figure 3. Distribution of coyotes from 1983 through present.



From 1986 through 1990, there were 56 credible observations and/or specimens of coyotes submitted to the NCWRC (Table 1). Twenty-eight (50%) of the 56 records occurred in the Coastal Plain region of North Carolina and were the result of illegal releases. Some of the coyote collected in North Carolina came from areas adjacent to controlled fox hunting preserves, which could suggest the coyotes were illegally brought into the pens and then escaped. In May 1989, an undetermined number of coyotes escaped a 1,240-acre controlled fox hunting preserve enclosure located in Rowan County when Hurricane Hugo damaged the fence (Wireback 1990). Adjacent states have also reported correlation between new coyote locations and escapes from enclosures (Hill et al. 1987). The first coyotes believed to have naturally dispersed into North Carolina were detected in 1988 in the far western counties of the state (Figure 3). This natural range expansion from Tennessee, Georgia, and South Carolina likely occurred due to removal of other large predators (wolves and cougar) reducing competition, major landscape level habitat changes, including the creation of trails and roads, and an increase of novel food resources such as crops. By 2005, coyotes occurred in all 100 North Carolina counties, and in 2009, coyotes were found on the barrier islands (Figure 3).

Table 1. Credible sightings and/or specimens of coyotes in the coastal plain region of North Carolina, 1955 through 1990.

County	Year	Information on sightings and/or individual coyotes recovered
Johnston	1955	NCSM collection, January 22, male.
Johnston	1975	Smithfield, collected by L. Barber on 3 May 1975 (probable deliberate introduction)
Beaufort	1983	Numerous visual sightings by local residents in Terra Cia and Acre area.
Washington	1983	Hunter kill, unknown sex and age.
Duplin	1986	Hunter killed a male on November 29 near the Cedar fork Community, delivered to NCSM.
Hyde	1986	NCWRC collected on February 2, male, delivered to NCSM. Possible dog. NCSM date collected 02/16/86.
Halifax	1986	Killed in December near Enfield, delivered to NCSM by Mike Scruggs with NCWRC.
Beaufort	1987	Numerous visual sightings in Terra Cia area since 1987, individuals, dens, and pups.
Jones	1987	Hunter killed male in November, 5 miles south of Trenton.
Jones	1987	Road killed female near Jones/Craven Co. line on HWY 17 in November, carcass delivered to NCSM. F#2 Partial skull.
Tyrrell	1987	Coyote shot during March. NC Museum #5285.
Tyrrell	1987	Hunter kill January 29, near Gum Neck, male. NCWRC Fur has skin.
Pasquotank	1988	Reported sighting by WEO.
Washington	1988	Visual report on November 3.
Jones	1989	Two pups caught in March near den site on farm near Cove City, delivered to NCSM, numerous sightings reported over past year. F#3.
Jones	1989	Two pups caught in March near den site on farm near Cove City, delivered to NCSM, numerous sightings reported over past year. F#3.
Pasquotank	1989	Hunter killed male on December 5 and visual sightings reported in same area, taxidermist has skull.
Beaufort	1990	WEO 326 sighting near Terra Cia in December.
Bertie	1990	Survey of district wildlife biologists for current coyote range.
Bladen	1990	Several sightings reported on the Dupont plant site.
Brunswick	1990	Several sightings reported on the Dupont plant site.
Columbus	1990	Road killed female located just north of Chadburn on HWY 410 between Hwy 76 and HWY 130 on March 21
Columbus	1990	A road kill about½ mile north of HWY 76 on SR1574 on March 14. F#5
Columbus	1990	A male trapped by landowner for turkey depredation on April 6 just south of SR1842, delivered to NCSM.
Columbus	1990	Collected 6 April 1990

County	Year	Information on sightings and/or individual coyotes recovered
Craven	1990	Hunter killed female between SR1401 and Neuse River on October 28, delivered to NCSM by David Sawyer.
Craven	1990	Road killed female near intersection of HWY 43 and SR1243 on December 9, delivered to NCSM.
Hertford	1990	Survey of district wildlife biologists for current coyote range.
Jones	1990	Hunter killed two males of three individuals near Pollocksville on October 27, delivered to NCSM, numerous sightings reported in past 2 years. Possible dogs. F#8.
Jones	1990	Hunter killed two males of three individuals near Pollocksville on October 27, delivered to NCSM, numerous sightings reported in past 2 years. Possible dogs. F#9
Martin	1990	Survey of district wildlife biologists for current coyote range.
Halifax	1990	Hunter observed 5 coyotes 6 miles ENE of Enfield and killed one.

Coyote Biology and Life History

Coyote Description: Coyotes are members of the family Canidae (includes foxes, wolves, domestic dogs). They have pointed and erect ears, and long slender snouts, their tail is bushy and black-tipped and is usually carried pointing down. Their fur is typically dark gray but color phases range from blonde to black. Their long hair, especially in winter, can make them appear heavier and larger than they are. Adult coyotes are generally 3.5 to 4.5 feet from nose to tail and stand about 2 feet tall (Bekoff and Gese 2003). Though similar in height to a Labrador retriever, they generally weigh about 20–45 pounds in North Carolina (about the weight of a border collie) due to their narrow body frame. Male coyotes tend to be larger than females. In North Carolina, coyotes may be mistaken for domestic dogs or red wolves, with which they can hybridize. The existence of hybrids, though uncommon, can make identification difficult.

Hybridization: Coyotes have been documented to hybridize with domestic dogs and gray wolves (Bekoff and Gese 2003). This seems to occur primarily when densities are low and suitable coyote mates are unavailable (Kays et al. 2009). Often hybrids, especially those with domestic dogs, are less likely to successfully raise young because domestic dogs don't have the same reproductive cycle as coyotes (Bekoff and Gese 2003). However, some genetic studies have found a low level of domestic dog and wolf DNA in some southeastern coyotes so

successful reproduction can occur, though rare. This most likely occurred when the first coyotes were illegally translocated and released and other coyotes were scarce (Adams et al. 2003). When they could not find coyote mates, because so few individuals existed, they sought the closest species they could find, domestic dogs. As coyote density has increased and mates more readily available, this becomes more and more unlikely to occur.

Habitat: Coyotes live in all habitat types, from wetlands to sandhill pines, farmland to mountains, forests to urban areas (Bekoff and Gese 2003). Preferred habitats range from agricultural fields to forested regions and suburban neighborhoods. Urban coyotes also tend to have higher use of green spaces within urban areas such as wooded tracts and cemeteries and avoid more human-associated habitat such as yards (Gehrt et al. 2009).

Diet: Coyotes are omnivores, meaning they feed on a wide variety of food sources. Their diet tends to be localized, changes seasonally, and focuses on the most abundant or preferred food sources. (Stratman and Pelton 1997, Tremblay et al. 1998, Bekoff and Gese 2003, Schrecengost et al. 2008). For instance, in the Southeast, persimmon become a common food item for coyotes when they ripen in fall (Grogran 1996, Elfeldt 2014). Food sources include fruit, berries, pet food left outside, small mammals (voles, rats, and mice), garbage, deer, carrion, rabbits, birds, snakes, frogs, insects, and other available food sources (Bekoff and Gese 2003, Bollin-Booth 2007, Elfelt 2014, McVey et al. 2013, Swigen et al. 2015). Coyotes can also prey on livestock and domestic pets, although research suggests that consumption of these animals comprise a small percentage of the total diet, if present at all (Grogan 1996, Parker 1999, Poessel et al. 2017).

A project in Alabama, Mississippi, Kentucky, and Tennessee analyzed coyote diets on areas classified as either high deer density or low deer density. They found deer prevalence in scat was higher in the high deer density areas and lower in low deer density areas, which supports that coyotes switch their diet to what is most abundant (Blanton and Hill 1989). The same project noted that fawns were the most frequent major food item in scats (74.2%) during fawning in high deer density areas, but the least frequent major food item in scats (8.8%) on low deer density areas (Blanton and Hill 1989). A more recent study found occurrence of deer was high in coyote scats during a large outbreak of epizootic hemorrhagic disease (EHD), resulting in an abundance of carcasses (Table 1, Morin et al. 2016).

Table 2. Percent occurrence of food items in coyote (*Canis latrans*) scats in studies using molecular identification of species in North Carolina and western Virginia.

Location	Western Virginia	Albermarle Peninsula	Fort Bragg, NC
Source	Morin et al. 2016*	McVey at al. 2013*	Swigen et al. 2015
Samples	n=225	n=64	n=590
Food item			
White-tailed deer	42.0	24.8	8.0
Rabbits	3.0	29.7	5.3
Small rodents	16.0	32.7	7.6
Other Mammals	11.0	7.9	7.6
Vegetation	11.0	3.0	40.7
Other	0.0	2.0	0.5
Insects	13.0		21.4
Birds	4.0		2.9
Antropogenic			5.9
*Used fecal DNA analysis to identify scat species			

Reproduction: Coyotes typically mate for life and breeding occurs from January through early March. Coyotes give birth in dens, either ones they have dug themselves, an enlarged animal hole, or another existing cavity such as a hollow tree, culvert pipe, or rocky outcrop (Bekoff and Gese 2003). Pups are born in March through May and the typical litter size averages 4 to 6 pups. Coyote pups are born altricial, meaning blind and helpless. Their eyes open after about 2 weeks and they will start to move around outside of the den as early as 3 weeks. They are weaned between 5–7 weeks and reach adult size at about 9 months of age (Bekoff and Gese 2003).

Coyote reproduction is density-dependent, which means if the density of coyotes is high, coyotes will have less pups, fewer pups survive to adulthood, and age at first breeding is delayed. Whereas if the density of coyotes is low, they will have larger litter sizes, higher pup survivorship, and coyotes breeding at a younger age (Gier 1968, Chambers 1992). This density-dependent reproduction is a key reason that attempts to eliminate or drastically reduce the coyote populations are unsuccessful. Drastic reductions in the density of a population leads to corresponding increases in reproduction.

Home Range: Home range size is highly variable and dynamic, influenced by habitat, geography, food availability, reproductive status, social status, sex, and season (Mastro 2011). Home ranges can vary between 1,000 and 16,000 and are smaller during denning and pup rearing season. A study on the Albemarle Peninsula documented home ranges of "resident" coyotes

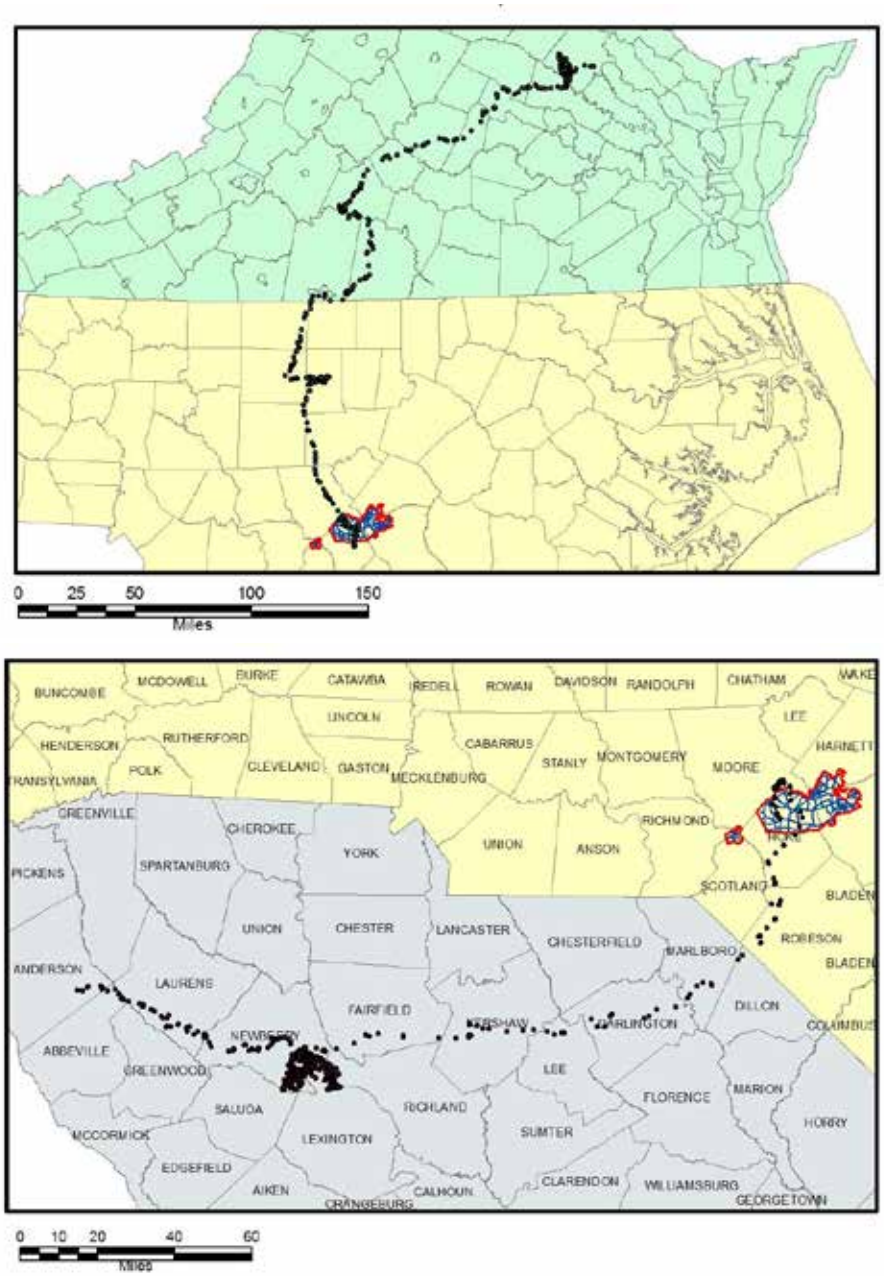
averaged approximately 6,500 acres. Coyotes considered transients in that study roamed an average of 76,100 acres (Hinton 2014). A study on Fort Bragg, North Carolina showed coyote home ranges averaged 21,000 acres. The researchers suggested the large home range size in this area likely reflects the low food availability in that region (Elfelt 2014).

Territory and Dispersal: Coyote populations are comprised of residents and transient individuals (Morin 2015). Resident coyotes are territorial and actively keep transient coyotes out of their home range (Bekoff and Gese 2003). If resident coyotes are removed, transient coyotes will move into the vacated area (Windberg and Knowlton 1988, Knowlton et al. 1999, Hinton 2014). This rapid immigration of coyotes into vacant territories is a demonstration of "compensatory immigration" that occurs as a feedback mechanism to high mortality in density dependent populations (Morin 2015). Transient coyotes are a critical component of coyote population dynamics, as these individuals are constantly searching for available territories, a limiting resource for coyotes (Messier and Barrette 1982, Harrison 1992, Windberg and Knowlton 1988, Knowlton et al. 1999, Hinton 2014).

Coyotes are able to rapidly reoccupy a vacant territory through their high dispersal potential and the use of "biding" areas. An example of a biding area is when a transient coyote occupies the interstitial spaces between territories, ready to fill the territory once it becomes vacant (Hinton et al. 2015). However, there are other types of biding areas in highly exploited coyote populations. In areas with high coyote mortality, resident coyotes may be more tolerant of younger coyotes remaining in the natal territory (i.e., the biding area), resulting in delayed dispersal (Messier and Barrette 1982, Patterson and Messier 2001, Atwood and Weeks 2002, Atwood 2006). Delayed dispersal may increase foraging efficiency of parents, alleviate reproductive costs through cooperative breeding, and reduce subadult mortality during high-risk dispersal (Messier and Barrette 1982, Patterson and Messier 2001, Atwood and Weeks 2002, Atwood 2006). Late-dispersing young could increase their chance of assuming a nearby territory or the natal territory when residents are removed, likely improving reproductive fitness (Morin 2015). Lastly, there is often intensive competition for territories containing more productive habitat. If there is high mortality in these productive habitats, there will be rapid territory turnover in these areas (Patterson and Messier 2001, Morin 2015).

Movements can be expansive in the fall and winter as coyotes explore dispersal opportunities, defend territory boundaries, and/or search for potential mates (Parker and Maxwell 1989, Patterson and Messier 2001, Gosselink et al. 2003). Young coyotes usually begin to disperse from their natal territory by late November or December. Dispersal rates are high and dispersal distances can be extensive; records show that some coyotes in North Carolina have dispersed more than 200 miles in just a few months (Figure 4). Their propensity for dispersal is why attempts to eradicate coyotes from an area are unsuccessful; as coyotes are removed, dispersing coyotes will fill the empty void.

Figure 4. Dispersal of GPS-collared juvenile female coyote from Ft. Bragg, North Carolina to Virginia and subadult female coyote from Ft. Bragg, North Carolina to South Carolina. Map courtesy of NCSU.



Mortality and Survivorship: The primary sources of coyote mortality are regulated hunting and trapping, nuisance and damage removal, and roadkill (Bekoff and Gese 2003, Stevenson 2015). Coyote pups may be susceptible to predation by other carnivores, like bobcats or black bears, and avian predators like owls, though the extent is unknown. Other sources of coyote mortality

include disease, exposure, dehydration, and starvation. Most of these mortality factors are more common in younger animals than adults, but can affect all age classes (Bekoff and Gese 2003).

Annual survival was found to be higher (60-70%) during the coyotes' colonization period (i.e., when coyotes expanded their range) and decreased (50%) after coyotes become established due to increased human-caused mortality (Crete and Lemieux 1996, Morin 2015). Mortality rates are higher for juvenile and individuals <1 year of age than for adult coyotes, and increases if the coyote disperses (Hilton 1978, Messier and Barrette 1982, Harrison 1986, Crete and Lemieux 1996, Lloyd 1998, Crete et al. 2001, VanDeelen and Gosselink 2006, Atwood 2006, Morin 2015). A study on Fort Bragg, where hunting access is restricted, found adult (≥2 years) coyote survival was 86% and survivorship of coyotes between 9 months and 2 years was 75%. The mortality factors that could be identified included roadkill and trapping (Stevenson 2015).

Coyote Behavior: Coyotes are most active at dawn and dusk (crepuscular), but can be active throughout the day (Bekoff and Gese 2003). Urban coyotes tend to be more nocturnal than rural coyotes, most likely to avoid human activities (Gehrt 2007). Coyotes are often wary of people and will either spatially or temporally avoid areas in which threats are perceived. For example, lack of harassment or exploitation can result in coyotes shifting to more diurnal activity versus nocturnal activity (Kitchen et al. 2000). Nocturnal activity of coyotes may be an adaptation to minimize contact with humans, despite their eyesight being best adapted to diurnal and crepuscular activity (Kavanua and Ramos 1975, Andelt and Gipson 1979, Holzman et al. 1992). In some cases, coyotes can become acclimated to humans in the absence of threats, and in areas where unnatural human food sources (pet food and garbage) are readily available. If unnatural food sources are not removed, coyotes may become increasingly habituated to humans.

Coyotes will form packs, but in most cases the packs are related individuals, including an alpha male and female who breed, one or more juveniles born the previous year that did not disperse, and the pups from the current year. Some coyotes will be transient or "loner" animals, which do not breed or maintain a territory (Bekoff and Gese 2003). While these transients are often young, dispersing animals, some will remain transient into adulthood, some adults become transient after the death of a mate, or at an old age (Gese et al. 1988, Kamler and Gipson 2000).

Coyotes have an elaborate repertoire of vocalizations (howls, yips, barks), which serves many purposes, including to locate pack members, distract threats away from their den, and to mark and maintain their territory (Brewster et al. 2017). Howls can be heard up to 3.2 km away and howling frequency is not linked to the intensity of the moonlight (Knudson 1946, Wolfe 1974, Walsh and Lehman 1989). In the late summer, pups become very vocal as they practice howling to mimic their parents. Because of the hollow tone of the howl, a pair of coyotes often sounds like a huge group and estimates of coyote numbers in an area based on howling are often greater

than actual coyote numbers (Knowlton 1972). In a study using 427 participants, 90% overestimated the actual number of coyotes howling by nearly 2-fold (Brewster et al. 2017).

The complex vocalization of coyotes may afford them an ability to seem more numerous than they actually are (Harrington 1989, Brewster et al. 2017). Having a false belief of coyote abundance within an area could exacerbate other coyote misperceptions held by the public (Brewster et al. 2017). For example, producers who lose livestock to predators may assume the culprit was the perceived most abundant predator in the area - in our example, coyotes; however, often the offending animals are actually a different species (e.g., feral dogs, Brewster et al. 2017, S. Henke, unpublished data). Misidentification of the depredating animal could lead to continued depredation issues for the producer, as the offending animal (feral dogs) was not identified and removed from the area.

Diseases and Parasites: There are a number of diseases and parasites that can infect coyotes and influence coyote population dynamics (Gier et al. 2001, Bekoff and Gese 2003). While coyotes, like all mammals, can contract rabies, they are not a common carrier of rabies in North Carolina and there have been no major outbreaks of rabies among coyotes (Gier et al. 2001). Of coyotes tested for rabies from 1990–2016, 14 tested positive (Figure 5). Prevalence of rabies in individual NC wildlife species is unknown, but rabid coyotes are relatively uncommon compared to domestic animals and other wild animals, like raccoons, skunks and foxes (Figure 5).

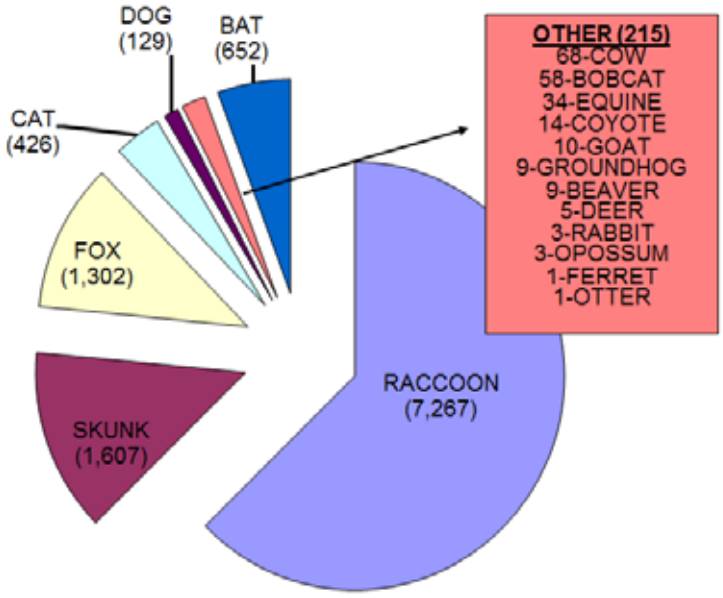


Figure 5. Number of positive rabies cases in North Carolina from 1990 through 2016.

Coyotes can also contract canine distemper (Trainer and Knowlton 1968, Gese et al. 1997, Cypher et al. 1998, Grinder and Krausman 2001). Domestic dogs are the primary reservoir for canine distemper and the virus is of significant concern for other species, like the gray fox (Nicholson and Hill 1984, Gates et al. 2014). Little research has been completed on canine

distemper virus impacts on coyote populations, but it is generally thought that while it can decrease pup survival, it doesn't have a large impact on adults (Gier et al. 1978). Coyotes are also susceptible to canine parvovirus, which, while it does not affect adults, can cause pup mortality (Gese et al. 1997, Grinder and Krausman 2001). This disease, like distemper, can also impact the gray fox, the red fox, and the domestic dog. There is also increasing documentation of canine parvovirus being detected in other species such as members of the weasel family like river otter (Sanders, North Carolina State University, unpublished data). Evidence of parvovirus in coyote populations in North Carolina is scarce, and prevalence in other species in the state is not known.

Research in Michigan also identified bovine tuberculosis in coyotes and suggested they could be sentinels for bovine tuberculous in other wildlife, such as white-tailed deer (Bruning-Fann et al. 2001, Atwood et al. 2007, Berentsen et al. 2011). Coyotes in other parts of the U.S. have been documented to have antibodies (meaning they've been exposed, but survived the infection) to canine infectious hepatitis, the plague, canine coronavirus, canine parainfluenza virus, canine adenovirus, tularemia, toxoplasmosis, and leptospirosis, though sampling for antibodies to these diseases has not been completed in North Carolina (Davidson et al. 1992, Bekoff and Gese 2003).

Both demodectic and sarcoptic (*Sarcoptes scabei*) mange can infect coyotes (Gier et al. 2001). Demodectic mange is caused by a mite (*Demodex canis*) that infects the follicle of the hair and causes it to become irritated and inflamed, which often causes hair loss (Gier et al. 2001). Sarcoptic mange is more common and occurs when the *Sarcoptes scabei* mite burrowing into the epidermal layer of the skin and can result in matted fur with little insulating value from lymph oozing through the skin (Gier et al. 2001). Mange itself is not deadly to coyotes, but the loss of hair during cold winter months can result in animals dying of exposure or the presence of the mites can result in secondary infections from the coyote biting and scratching at the infected sites. There is colloquial evidence of canids like coyotes recovering from mange, but the rate of survival compared to mortality of the disease in the wild is not well understood (Pence et al. 1983). Other external parasites that can infect coyotes includes fleas, ticks, mites, and lice (Gier et al. 2001, Foster et al. 2003).

Internal parasites that infect coyotes includes flukes (trematodes), tapeworms (cestodes), intestinal worms (nematodes, ascarids), hookworms (anclyostomids), heartworms (filaroids), esophageal worms (spiruroids), lungworms (trichinellids), kidney worms (dioctophymoides), spiny-headed worms (acanthocephalids), protozoans, and coccidian fungus (Dunatchik 1967, Ford 1983, Davidson et al. 1992, Eastman 2000, Gier et al. 2001, Foster et al. 2003). Many internal parasites that infect coyotes haven't been documented to impact the general health of coyotes, but merely provide a host for the parasite's life cycle (Gier et al. 2001). However some internal parasites, like heartworms, can impact body mass and activity levels of coyotes and in

some cases could lead to the death of the animal (Sacks and Blejwas 2000). Most of the internal parasites that infect coyotes do not infect humans, but some may infect domestic dogs or impact other species like foxes. Prevalence of both internal and external parasites in North Carolina coyotes has not been evaluated.

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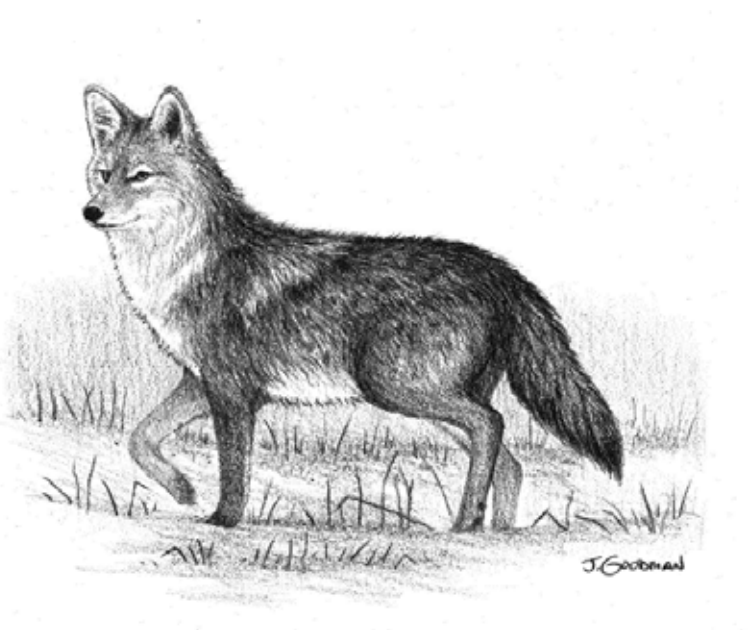
Appendix C. Report to General Assembly for Mitchell County



Final Report to the Environmental Review Commission on

Pilot Coyote Management Assistance Program in Mitchell County

January 20th, 2017

January 20, 2017

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

Honorable Chuck McGrady
N.C. House of Representatives
300 N. Salisbury Street, Room 304
Raleigh, NC 27603-5925

Senator Trudy Wade
N.C. Senate
300 N. Salisbury Street, Room 521
Raleigh, NC 27603-5925

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 Mitchel 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 24.0[1] (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 ($\chi 2$) 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 attached (50%),
5. a child being attached (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.

<u>Hunting</u>

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.

<u>Trapping</u>

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:

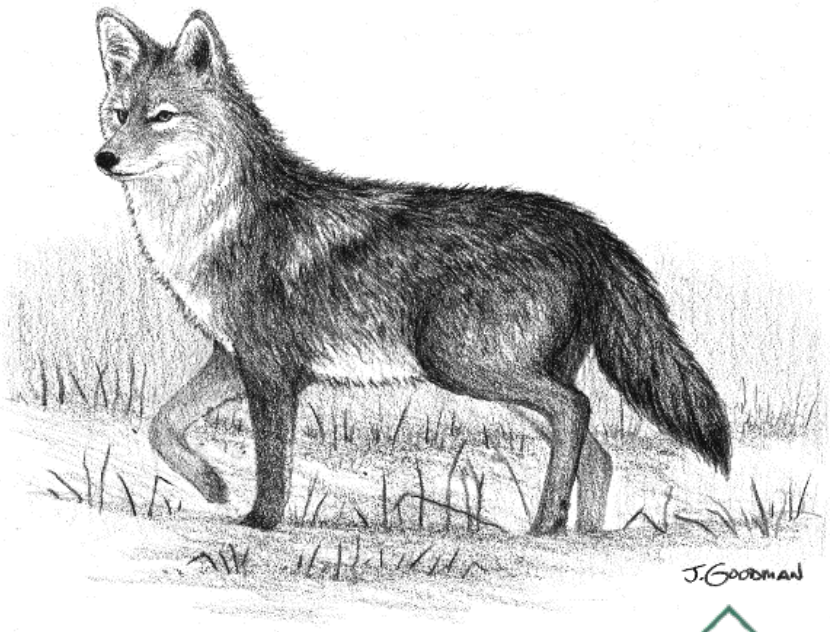
1. Promote the local Cooperative Extension offices as a hub for local citizens to obtain information specifically related to coyote biology and management, and connect the citizens with appropriate professionals to address their needs.
2. Distribute and or make readily available all current coyote management 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



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NORTH CAROLINA Wildlife RESOURCES COMMISSION

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")

	Times					Don't know
	0	**1**	**2-5**	**6-10**	**11+**	
… 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

24.1% They were released in NC by hunters

50.0% They were released by a government agency

3.7% Other (specify): _Wildlife, Wildlife Commission_

25.9% Unsure

1.9% They have always been here

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 ← 0	1	2	3	4 → **Very Concerned**
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:_____	❑	❑	❑

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	**Highly Unacceptable** 0	1	2	3	**Highly Acceptable** 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

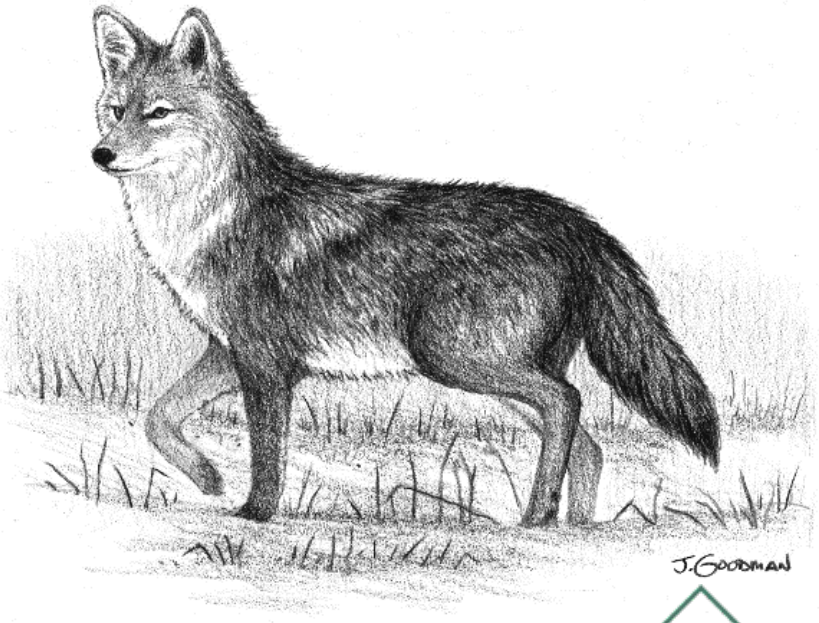
21) What is the highest level of schooling/education that you have completed? (Check one)

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



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NORTH CAROLINA Wildlife RESOURCES COMMISSION

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")

	Times					Don't know
	0	**1**	**2-5**	**6-10**	**11+**	
… 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

48.0% They were released in NC by hunters

60.0% They were released by a government agency

8.0% Unsure

4.0% They have always been here

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)

	Not concerned ← 0	1	2	3	→ **Very Concerned** 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:_____	❑	❑	❑

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	**Highly Unacceptable** 0	1	2	3	**Highly Acceptable** 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_____

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

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.

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

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.

Register early; workshop limited to 50 people

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

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NORTH CAROLINA Wildlife RESOURCES COMMISSION

WS Wildlife Services
Protecting People | Protecting Agriculture | Protecting Wildlife

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Appendix D. Tools for Addressing Coyote/Livestock Issues

Tools for Addressing Coyote / Livestock Issues

In most settings, a single management tool will not be enough to prevent and manage coyote problems. The NCWRC recommends producers consider an integrated approach to coyote predation management, using appropriate lethal and nonlethal tools to prevent and address problems with coyotes on their property. Livestock producers should seek out technical guidance as they develop their predation management approach to ensure that their efforts have the best chance for success. Understanding when livestock are most vulnerable to coyotes allows producers to adjust animal husbandry practices to better protect their stock.

The use of nonlethal tools to secure and protect livestock is the best approach to preventing problems from developing with coyotes. Lethal control is most effective at addressing individual problem coyotes causing depredations, and should be implemented in conjunction with preventative management for the best outcomes.

Nonlethal Tools

Exclusion: Complete exclusion of coyotes from areas where livestock are kept is an effective, but sometimes impractical nonlethal management tool. Coyotes are readily able to climb over and dig under poorly constructed fences, so the placement and construction of the fence is critical. Standard livestock fencing is typically not adequate to exclude coyotes. For small areas, solid fencing that is at least 5.5 feet high and that is buried at least two feet deep can be effective. Adding charged electric wires to the top of fences, or installing “coyote roller” devices or barbed wire can increase the effectiveness of these fences at excluding coyotes. Electric fencing can also be effective at deterring coyotes, and the addition of electric wires to existing fencing can be a cost-effective option. Charged wires can be spaced out at regular intervals amongst ground wires, with an additional charged wire placed 6-8 inches outside of the fence to discourage digging under. Other techniques to enhance the effectiveness of fencing include fladry and the installation of frightening devices. The NCWRC recommends producers consider fencing for areas where the likelihood of predation events is high, such as birthing areas or corrals where animals are kept at night.

Frightening Devices: During short periods of time frightening devices such as lights, sounds, or repellants can be effective at deterring coyotes from small areas. Coyotes will quickly acclimate to individual frightening devices, so the use and rotation of multiple stimuli is recommended to increase the effectiveness of this tool. Lights are recommended for corrals and night pens to increase their effectiveness at protecting livestock.

Managing Lambing/Calving: Most livestock losses associated with coyotes occur when animals are giving birth, when both female adults and newborn animals are vulnerable. Producers should consider several factors that contribute to livestock vulnerability during this period including the timing of lambing/calving, location of lambing/calving, and health of ewes/cows. Predation by coyotes on livestock can be tied to seasonality, with losses more likely to occur in the spring and summer months when coyotes have increased nutritional demands due to pups. Additionally, when births are spread out over many weeks or months, coyotes may be encouraged to stay in the birthing area, leading for a greater likelihood of predation. Shortening the birthing period can be effective at reducing the risk of predation. Hand in hand with timing of birthing is location for birthing. Confinement of sheep and goats in sheds or pens during lambing and calving in smaller pastures close to barns or corrals is recommended to protect animals during their most vulnerable period. Human presence in lambing/calving areas can act as a deterrent to coyotes, as can the use of lights and frightening devices. Pastures where predation has occurred in the past should be avoided for calving, as should pastures with rough terrain and dense vegetation on the borders. In addition to timing and location of lambing/calving, health of ewes and cows can impact the likelihood of predation by coyotes, as coyotes often target smaller, weaker animals. Healthy ewes and cows are more likely to produce healthy young, and are more effective at defending their young from threats including coyotes. Location of birthing can be especially important for first-calf heifers and ewes.

Livestock Guard Animals: Livestock guard animals can be very effective at preventing depredation. These animals form strong bonds with their herd/flock and rigorously defend them from coyotes and other predators. Dogs, donkeys, llamas, and mules are commonly used as livestock guard animals. Livestock guard animals are most effective when used in conjunction with other husbandry practices, such as fencing and pasture selection. Multiple livestock guard animals may be required based on the size of the herd/flock and the terrain of the area where livestock are kept.

Carcass Management: Coyotes are known scavengers and will be attracted to the presence of carcasses. Overtime, the consumption of livestock remains can habituate coyotes to livestock and increase the potential for depredations. Dead livestock should be removed and disposed of offsite whenever possible.

Lethal Tools

Trapping: When non-lethal techniques do not deter depredations, targeted or selected removal of offending coyotes may achieve management objectives. Trapping is the most effective and efficient means for targeting and removing coyotes that are actively depredating livestock.

Removing one or two offending individuals in a small area may stop the problem. Trapping coyotes requires knowledge and a skill set not commonly possessed by the average individual. Well trained and experienced coyote trappers will be required to successfully remove problem animals without exacerbating the issue by causing the coyotes to become more difficult to trap due to poor techniques, resulting in the coyote becoming "trap-smart." In addition, training and unique skills are needed to efficiently capture coyotes while minimizing the capture of non-target species.

Appendix E. 2012 Fox Coyote Study Report for the General Assembly

Fox and Coyote Populations Study Final Report

April 1, 2012

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

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NORTH CAROLINA WILDLIFE RESOURCES COMMISSION
GORDON S. MYERS, EXECUTIVE DIRECTOR
1701 MAIL SERVICE CENTER, RALEIGH, N.C. 27699-1701

Gray fox (photo: Maine Dept. of Fisheries and Wildlife)

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LETTER OF TRANSMITTAL

North Carolina Wildlife Resources Commission
1701 Mail Service Center
Raleigh, North Carolina 27699-1701

APRIL 1, 2012

TO: The Honorable, Thom Tillis, Speaker of the House of Representatives
The Honorable Phil Berger, President Pro Tempore of the Senate
Representative James H. Langdon, Jr., Co-chair, House Committee on Agriculture
Representative Efton M. Sager, Co-chair, House Committee on Agriculture
Senator Don East, Co-chair, Senate Committee on Agriculture, Environment, and Natural Resources
Senator Brent Jackson, Co-chair, Senate Committee on Agriculture, Environment, and Natural Resources
Senator David Rouzer, Co-chair, Senate Committee on Agriculture, Environment, and Natural Resources

On behalf of the North Carolina Wildlife Resources Commission, I submit this final report for your consideration.

Respectfully,

Gordon S. Myers, Executive Director

EXECUTIVE SUMMARY

In June 2011, the North Carolina General Assembly directed the Wildlife Resources Commission (Commission) to study fox and coyote populations and to recommend management methods and controls designed to ensure statewide conservation of fox populations while managing adverse effects of coyote populations. Since that time, the Commission has gathered information about the attitudes and perspectives of numerous stakeholder groups. In addition, the Commission compiled all available information on the harvest and status of foxes and coyotes by hunters and trappers. Included herein is a detailed presentation of the different authorities for regulating take of foxes and coyotes, including the Commission's limited authority for regulating take of foxes, and the resulting significant variation in fox hunting and trapping seasons. The potential impacts (both positive and negative) of a statewide fox trapping season are evaluated.

Foxes have occurred in N.C. throughout recent history, but coyotes are a relatively new arrival. With changes in the landscape of our state; changing perspectives about fox hunting and fox and coyote trapping by hunters, trappers, and the general public; concerns over coyote predation on wild and domestic animals; and human/fox/coyote interactions, publically-acceptable approaches to managing fox and coyotes have changed. Because of these changes, we must determine how best to modify current approaches to regulating take of foxes and coyotes that meet the needs of our diverse citizenry while assuring the sound conservation and management of these species. The Commission's long-term goal is to improve the efficiency and effectiveness of coyote control measures by reducing regulatory barriers for our citizens while ensuring the sound conservation of fox populations.

Based upon this study, the Commission offers the following recommendations:

- Develop a structured decision-making process to guide all regulatory changes
- Maintain and expand hunting opportunities for foxes and coyotes where feasible
- Match new or amended fox trapping seasons with the statewide furbearer trapping season
- Increase public awareness of best management practices for trapping foxes and coyotes
- Authorize the Commission to regulate all gear types used in trapping
- Examine regulations pertaining to the operation of Controlled Fox Hunting Preserves including the live sale of foxes and coyotes
- Increase public awareness of coyotes
- Implement localized fox and coyote abundance surveys
- Consider providing additional urban fox and coyote trapping opportunities
- Consider removing prohibitions on hunting and trapping foxes in Yancey County

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INTRODUCTION

On June 17, 2011, the General Assembly passed a bill (N.C. Session Law 2011-380, House Bill 755) that directed the Wildlife Resources Commission (Commission) to study fox and coyote populations. Signed into law June 27, 2011, the statute called for the Commission to "undertake a study of fox and coyote populations in the State and recommend management methods and controls designed to ensure statewide conservation of fox populations while managing adverse effects of coyote populations." HB 755 further directed the Commission to "solicit input from interested stakeholders, including hunters, trappers, controlled hunting preserve operators, public health authorities, local governments, the North Carolina Department of Agriculture and Consumer Services, and private landowners." The Commission was directed to complete its study by April 1, 2012, and submit a report, including any proposed legislation, to the Speaker of the House of Representatives and the President Pro Tempore of the Senate; the Chairs of the House Committee on Agriculture; and the Chairs of the Senate Committee on Agriculture, Environment, and Natural Resources.

Our focus throughout this effort was to compile all data and other information available to the Commission on the history and status of foxes and coyotes in N.C., and feedback from various constituents, on issues and positive approaches to conserve foxes while optimizing management of coyotes. Our long-term goal is to improve the efficiency and effectiveness of coyote control measures by reducing regulatory barriers for our citizens while ensuring the sound conservation of fox populations.

To compile information about their attitudes and opinions on issues related to managing foxes and coyotes, we contacted stakeholders through direct meetings, and telephone and e-mail surveys. Four meetings were held with representative groups of stakeholders, including: meetings held in Raleigh with the N.C Trappers Association and in Goldsboro with fox hunters on December 12, 2011; and meetings with representative controlled fox hunting preserve operators in Williamston on February 8, 2012 and in Troy on February 15, 2012. In total, 34 constituents attended these meetings. To gain additional information from our constituents, we contacted a goat farmer, horse owner, and representatives of the Quality Deer Management Association, Quail Unlimited, N.C. Cattlemen's Association, N.C. League of Municipalities, N.C. Farm Bureau, N.C. County Commissioners Association, Association of Local Health Directors, N.C. State Health Director, and N.C. Department of Agriculture and Consumer Services either by telephone or e-mail and asked a series of nine questions related to management of foxes and coyotes in N.C. (Appendix A).

From these efforts, the Commission received direct feedback from trappers, hunters, and controlled fox hunting preserve operators and survey feedback from representatives of Quail Unlimited, Quality Deer Management Association, N.C. Cattleman's Association, N.C. Cattlemen's Beef Council, N.C. Farm Bureau, a goat farmer, a horse owner, Wilkes County Animal Control, N.C. Division of Public Health, N.C. Alliance of Public Health Agencies, Orange County Animal Services, and N.C. Department of Agriculture and Consumer Services, Veterinary Services Division and Forest Service.

Additional information and data provided herein on the distribution, status, and harvest of foxes and coyotes were compiled from Commission records.

REGULATORY AUTHORITY

Over the years, numerous laws and rules have been adopted that result in diverse regulatory authorities and a broad range of legal options for managing fox and coyote populations. In many cases, this suite of diverse options creates confusion among the public and has created some barriers to effectively conserving fox populations while managing coyotes, which to most of our citizens are overabundant. Because one of the Commission's goals is to remove regulatory barriers and increase the options available to our citizens to manage foxes and coyotes, especially on private property, a thorough review of these regulatory authorities is important.

Commission Authority to Regulate Fox Hunting – Foxes are classified as game (NCGS § 113 129). However, according to NCGS § 113 291.4, "*All of the regulatory powers granted the Wildlife Resources Commission generally with respect to game, wild animals, and wildlife apply to foxes unless there are specific overriding restrictions in this section*." Under current overriding restrictions, the Commission may not regulate the taking of foxes with the use of dogs except in areas where this would be detrimental to turkey restoration projects. Because turkey restoration now is completed statewide, the Commission may not restrict the use of dogs to take foxes anywhere in the state, including west of the line delineated in NCGS § 113-291.5, an area in which the Commission has authority to regulate all other aspects of hunting with dogs. NCGS § 113 291.4 specifically states that foxes may be taken with dogs year-round and during both night and day.

The Commission does not have the authority to regulate fox hunting with firearms, except to:

1. continue the fox hunting and trapping season for Caswell, Clay, Graham, Henderson, Hyde, Macon, and Tyrrell counties that was established in the early 1980s,
2. establish fox population control measures in areas where State Health Director has notified the Commission of the presence of a contagious animal disease in a local fox population, and
3. set bag limits for foxes taken with firearms east of I-77 and Mitchell and Caldwell counties.

The Commission may not allow the use of electronic calling devices for foxes.

The Commission has the authority to regulate take with archery equipment because there is no prohibition in § 113 291.4 or § 113 291.4.A against the use of archery equipment to take foxes.

Commission Authority to Regulate Fox Trapping – Foxes are not classified as fur-bearers, but rather as game. Therefore, the Commission has no authority over fox trapping except as specifically authorized in NCGS § 113 291.4, which states, "*If, on the basis of its studies and other information available, the Wildlife Resources Commission determines the population of foxes in an area is fully adequate to support a harvesting of that population, the Wildlife Resources Commission may, upon passage of local legislation permitting same, open a season for taking foxes by trapping*." Any such local season open to fox trapping is open to fox hunting as well (NCGS § 113 291.4).

In regards to dead foxes, this same statute gives the Commission the authority to:

1. provide for the sale of foxes lawfully taken in areas of open season;

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2. implement a system of tagging foxes and fox furs with a special fox tag;
3. charge two dollars and twenty five cents ($2.25) for each tag furnished to hunters, trappers, and fur dealers;
4. limit the number of tags furnished to any individual as to area and as to number in accordance with area, bag, possession, or season limits;
5. require reporting and controlled disposition, not including sale, of foxes killed accidentally by dog hunters, motor vehicles, and in other situations; and
6. impose strict controls on the disposition of depredating foxes taken by owners of property, and authorize sale under controlled conditions of foxes taken under depredation permits.

Commission Authority to Regulate Coyote Hunting – Coyotes are classified as wild animals (NCGS § 113 129), but not game. Under this classification the Commission has the authority to set hunting seasons and bag limits (NCGS § 113 291.2) and designate manner of taking, including the use of artificial lights and electronic calls (NCGS § 113 291.1).

Commission Authority to Regulate Coyote Trapping – The Commission uses the same authority (NCGS § 113 291.2) to set trapping seasons and bag limits as for hunting seasons. Trap types for wild animals are specified in NCGS § 113 291.6. Trappers trap coyotes under the authority of their trapping license, although this license specifies that it is necessary for fur-bearing species (NCGS § 113 270.5).

Commission Authority to Regulate Controlled Fox Hunting Preserves – Persons who wish to operate a controlled fox hunting preserve must purchase a Controlled Hunting Preserve Operator License. Currently there are 144 Controlled Fox Hunting Preserves across N.C. (Figure 1). Pursuant to NCGS § 113 273, operators of controlled fox hunting preserves may purchase live foxes and coyotes from licensed trappers who live trap foxes and coyotes during any open season for trapping them and may, at any time, take live foxes from their preserves for sale to other licensed operators. Except for the purchase of live animals, the Commission is authorized to set standards for, and to license the operation of, controlled fox hunting preserves (NCGS § 113 273).

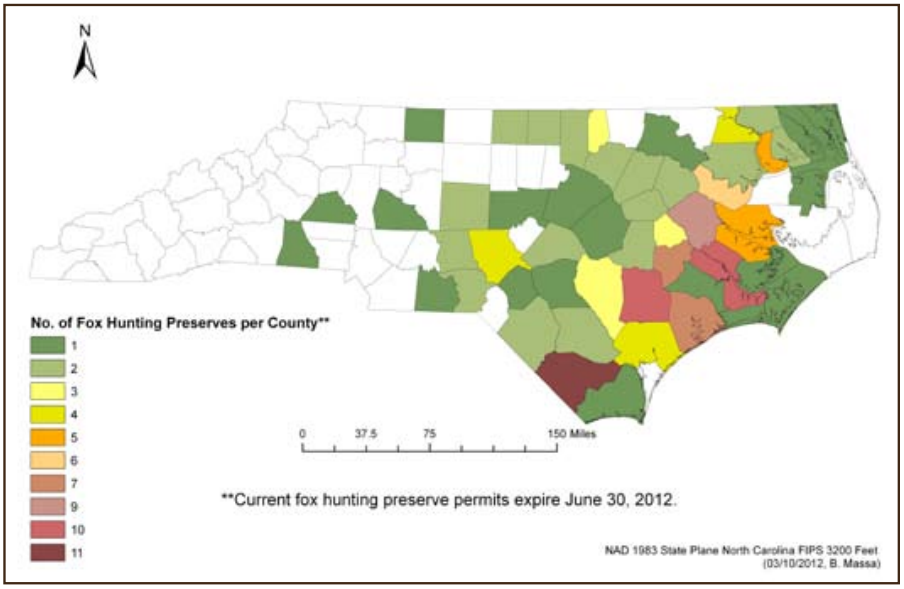

Figure 1. Distribution of 144 Controlled Fox Hunting Preserves in North Carolina, 2012.

Commission Authority to Regulate Nuisance Foxes and Coyotes – The Commission has the authority under NCGS § 113 274 to issue depredation permits to take foxes or coyotes that are "undesirable, harmful, predatory, excess, or surplus." The Commission has the authority to regulate the manner of taking and the disposition of wildlife taken with or without a permit. Although the conditions for receiving a depredation permit are outlined in the Commission's rules, NCGS § 113 274 states, "*Livestock or poultry owners shall be issued a depredation permit for coyotes upon request.*" Therefore, the Commission does not have authority to regulate issuance of depredation permits to livestock or poultry owners.

Commission Authority to Regulate Use of Snares for Trapping – NCGS § 113.291.1(b)(2) specifically prohibits the use of snares as a manner of take. However, NCGS § 113.291.6(h) specifies that "*[a] person who has been issued a depredation permit for coyotes under G.S. 113 274(c) may use a Collarum™ trap, or similar trap approved by the Wildlife Resources Commission, solely for the purpose of taking coyotes under that permit.*" Thus, the Collarum™-type trap is the only currently approved type of trap using a snare that is legal as a manner of take in N.C.

Commission Authority to Regulate Foxes and Coyotes for Public Health – Pursuant to NCGS § 113 291.4, "*Upon notification by the State Health Director of the presence of a contagious animal disease in a local fox population, the Commission is authorized to establish such population control measures as are appropriate until notified by public health authorities that the problem is deemed to have passed.*" This reference to a "contagious animal disease" could apply to a canine-specific disease, such as distemper, or one with human health implications, such as rabies. Regulatory authority in regards to rabies is clarified in NCGS § 130A 201, which gives the Commission the authority to "*... develop a plan pursuant to G.S. 113 291.2 (a1) to reduce the threat of rabies exposure to humans and domestic animals by foxes, ...*" Additional details on the Commission's authority and expectations on our agency are provided in NCGS § 113 291.2. Essentially, the Commission is authorized to implement a broad range of actions in response to a rabies emergency if declared by the State Health Director.

Resulting Variations in Hunting and Trapping Seasons – Under North Carolina General Statutes foxes are classified as game animals and all fox hunting and trapping seasons can only be established or changed by the General Assembly. Therefore, fox seasons cannot be established or altered by the Commission.

Fox hunting with dogs is allowed any time of year in all N.C. counties except Alamance, Caswell, Cleveland, Duplin, Lincoln, Madison, Wayne and Yancey which, through local law, either prohibit fox hunting altogether or establish a season. Eighty-five counties have a fox hunting season with weapons for all or part of the county (Figures 2 and 3). As specified in NCGS § 113 291.4, "*When the season is open for trapping, foxes may also be taken by the use of methods lawful for taking game animals, including the use of firearms*." Therefore hunting is allowed in all counties in which trapping is allowed, but trapping is not allowed in all counties that allow hunting. Forty-seven counties allow hunting, but not trapping. Some of these fox hunting seasons are established in statute; some are established through session law. When considering season dates alone, there are at least 27 unique fox hunting seasons among 85 different counties across the state.

Fox trapping seasons must be established by the General Assembly. Thirty-eight counties or parts thereof and one municipality have established fox trapping seasons. However, these 39 local jurisdictions do not all have the

same season. Due to differences in season dates, trap-size restrictions, trap-type restrictions, tagging requirements, live sale prohibitions, bag limits and swivel requirements, the 38 counties and one municipality have 22 unique trapping seasons (Figure 4).

In North Carolina, coyotes are classified as a nongame animal. Coyote hunting seasons and bag limits are established in Commission rules. Currently, coyotes may be taken by firearms, archery equipment and dogs during the daytime six days a week in all counties of the state, unless such take is restricted by local law. Coyotes may be taken by archery equipment and dogs on Sundays on private land. Coyotes may be trapped during the two furbearer seasons set forth in the Commission's rules. These seasons include all counties of the state. In addition, coyotes may be trapped anytime there is an open season for trapping foxes. Farmers can receive a depredation permit upon request to trap coyotes outside the trapping season. Depredation permits can also be issued for property owners experiencing damage from coyotes, or if there is a threat to public safety. Through these measures and within established statutory authority the Commission has maximized options for citizens to control coyote numbers. Currently, the Commission is promulgating rules to allow hunting coyotes at night with a light.

Figure 2. Counties with a fox hunting season with dogs in 2012, as legislated by the North Carolina General Assembly. Differences in color indicate differences among the fox hunting season (6 fox hunting seasons with dogs in 98 counties). Counties in white are currently closed to fox hunting with dogs.

Figure 3. Counties and areas with a fox hunting season allowing weapons in 2012, as legislated by the North Carolina General Assembly. Differences in color indicate differences among the fox hunting seasons (27 fox hunting seasons in 85 counties). Counties in white are currently closed to fox hunting with weapons.

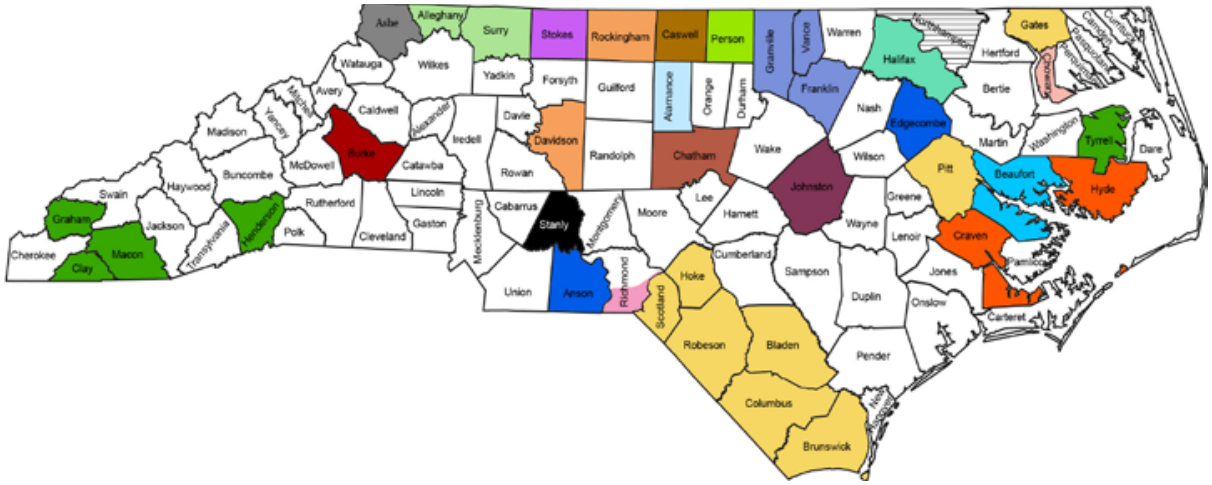

Figure 4. Counties and areas with a fox trapping season in 2012, as legislated by the North Carolina General Assembly. Differences in color indicate differences among the fox trapping seasons (22 fox trapping seasons in 38 counties). Counties in white are currently closed to a fox trapping season.

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SPECIES ACCOUNTS

Gray Fox – The gray fox is North Carolina's only native fox. They have adapted well to human development and are common in suburban areas. Gray foxes are slightly smaller than red foxes and are much darker in color. They are sometimes confused with red foxes because of a reddish or rusty coloration on the sides of their necks and legs. The overall coloration is best described as a salt-and-pepper gray with a dark streak extending down the back, along the top of the tail and ending in a black tail tip. Adults may weigh as much as a red fox (seven to 15 pounds) but their shorter legs and shorter fur make them appear smaller. Gray foxes are unique in that they can climb trees.

The gray fox, North Carolina's only native fox, is unique in that it can climb trees. (photo: Illinois Department of Natural Resources)

In North Carolina, gray foxes inhabit all areas of the state from the Outer Banks to the Appalachian Mountains. Although viable populations are found in all of North Carolina's major habitat types, gray foxes are most numerous in the more productive areas of the Piedmont and northern Coastal Plain. They are often present in large tracts of wooded areas and also thrive in open farmland.

Gray foxes eat many types of food items including mice, rabbits, birds, eggs, and insects. They also eat a significant amount of wild fruits such as persimmons and grapes, and agricultural crops such as corn and peanuts.

Gray fox home range sizes vary considerably — from just over 70 acres to over 6,000 acres — depending on habitat quality, population density and the reproductive status of individual foxes. As coyotes become more abundant and expand their range into areas inhabited by foxes, red foxes are sometimes displaced, but gray fox populations do not seem to be affected. Because gray foxes have the ability to climb trees, it is possible for them to escape from coyotes.

Gray foxes are typically nocturnal although they will forage during daylight hours. They mate once a year during January and February. The gestation period is 59 days and pups are born in March through April. Three to five pups are born in a den, which may be only a hollow log or tree stump. During the late fall and early winter, gray foxes establish new home ranges. The average life expectancy is one to two years, with few living longer than six years in the wild. The annual mortality rate may be 50% or more. Canine distemper may be the most important mortality factor for gray foxes, with local populations rising and falling in response to the prevalence of this disease.

Most issues and concerns that people have about gray foxes are related to depredation on domestic poultry and concerns about diseases, especially rabies. Properly enclosing poultry can usually prevent depredations. Gray foxes can contract rabies, but interactions between people and gray foxes are rare. Gray foxes seen during the daytime are not necessarily diseased; they are often responding to the presence of outdoor pet food and the concentration of small animals around bird feeders, or moving about as needed to take care of their pups.

Gray foxes are economically important and a valuable natural resource. Foxes have long been hunted with hounds and they are an important furbearer to trappers. Gray fox fur became popular during the late 1970s for fur coats and collars and demand for their fur continues to some extent today. The number of licensed trappers and trapping effort varies over time and is largely related to the price paid for pelts in the fur market and prices paid for live animals sold to controlled fox hunting preserves. Based upon Commission records and records from other states, regulated hunting and trapping do not appear to affect overall gray fox population numbers. Relatively few foxes are annually taken from the population and because much of the state is in private ownership, there are numerous areas not open to hunting or trapping. Populations are maintained because foxes have a high reproduction rate and young disperse annually to colonize areas where others have been harvested.

Red Fox – The red fox is the most widely distributed canid (i.e., wild dog) in the world. There are no records of red foxes occurring in the eastern United States south of Rhode Island before the European red fox was introduced for sport hunting during colonial days. Red foxes are now common across N.C. and populations in most areas continue to remain stable, despite outbreaks of disease and sustained harvest levels. Red foxes have high reproductive rates, but as coyotes become more abundant they may be displaced.

The red fox, the most widely distributed canid in the world, is now common in North Carolina. (photo: U.S. Fish & Wildlife Service)

The red fox is named for its reddish coloration. The tail, body and top of the head are all some shade of yellow-orange to reddish-orange. The undersides are light, the tips of the ears and lower legs are black, and the tail is bushy with a white tip. Adults are the size of a small dog and weigh from seven to 15 pounds.

Like many other wildlife species, red foxes prefer a diversity of habitats rather than large tracts of one habitat type. Preferred habitats include farmland, pastures, brushy fields, and open forest stands, where they frequently hunt the edges of these open habitats. Red foxes eat a variety of prey, but mice, meadow voles, and rabbits form the bulk of their diet. They will also eat insects, birds, eggs, fruits, berries, animals they discover that are already dead, and garbage.

Red fox home ranges may vary in size with the abundance of food, the degree of competition with other animals, and the diversity of habitats. The average home range is between 1,000 and 5,000 acres. Most red fox activity occurs at night, but daytime movements are not uncommon. The gestation period is about 52 days and pups are born during late February through April. An average litter includes five pups, which are born in a den that the adults dig themselves or that was dug by another animal. Males bring food to the female until the pups can be left alone. The life expectancy of a red fox is about five years, although due to the many mortality factors, most do not live that long. Sarcoptic mange and canine distemper may be the most important mortality factors for red foxes, with local populations rising and falling in response to these diseases.

Most conflicts that occur between people and red foxes also involve depredation on domestic poultry and concerns about diseases, especially rabies. Properly enclosing poultry will usually prevent depredations. While red foxes can contract rabies, interactions between people and red foxes are rare because red foxes are shy and non-aggressive animals. While red foxes are primarily nocturnal, it is not unusual to see a red fox during the daytime. However, daytime sightings of red foxes are not a sign that the animal is diseased. Such sightings usually occur because foxes are responding to an abundance of food or moving about as needed to take care of their pups. For the same reasons as the gray fox, the red fox is economically important and a valuable natural resource. Red foxes can be a beneficial predator on mice and groundhogs on farms and in other rural situations. However, red foxes may also prey on domestic poultry in both rural and suburban areas.

Coyote – Although they are a relatively new arrival to our state, coyotes are now established in all 100 counties across N.C. Prior to the 1800s, coyotes were restricted to the prairies and grasslands of the Midwest. But as Europeans arrived and settled across North America, subsequent landscape changes and elimination of wolves allowed the coyote to expand its range toward the eastern United States. Extensive efforts have been devoted to controlling coyotes across the U.S., but despite these extensive control attempts coyotes have continued to expand their range.

The coyote is now established in all 100 counties in North Carolina.
(photo: National Park Service)

The first reported sighting of a coyote in N.C. was in Gaston County in 1938. The first confirmed coyotes that were collected came from Johnston County (1955) and Wake County (1970). Until the late 1980s, coyotes seen in North Carolina were likely due to illegal importation and release. By 1990, coyotes began to appear in western North Carolina as a result of natural range expansion from Tennessee, Georgia, and South Carolina.

Coyotes in North Carolina are smaller than wolves, have pointed and erect ears, and long slender snouts. The tail is long, bushy and black-tipped and is usually carried pointing down. Their color is typically dark gray, but can range from blonde to black. Adults are about the size of a medium-sized dog and may weigh between 20 and 45 pounds. In N.C., coyotes may be mistaken for dogs or red wolves, and the existence of both dog-coyote hybrids and red wolf-coyote hybrids can make identification difficult.

Coyotes feed on a wide variety of food sources, depending on what is most readily available and easy to obtain. Primary foods include fruit, berries, pet food left outside, small mammals (voles, rats, and mice), deer, rabbits, birds, snakes, frogs, and insects. Coyotes will also prey on livestock and domestic pets.

Coyote home ranges can vary from between 1,000 and 16,000 acres depending on season, habitat and food availability. Preferred habitats range from agricultural fields to forested regions and suburban neighborhoods. Coyotes usually dig their own den, but they will sometimes enlarge an old animal hole or use a natural hole in a rocky ledge as a den. Dens are usually hidden from view and used by coyotes to birth their young and sleep. Coyotes

mate for life and breeding occurs from January through early March. Pups are born in March and April and the typical litter size is six to eight pups. The family unit usually begins to disperse by late November or December. In many cases, one pup stays behind as a "helper" for the next year's litter. Coyotes are territorial and actively keep non-family members outside of their home range. Dispersal rates are high and distances can be extensive; several coyotes in North Carolina have dispersed more than 200 miles in just a few months. When an individual coyote or family group leaves or is removed, new coyotes will usually move into the vacated territory. These territories frequently overlap with a transient coyote that is searching for a mate or its own territory. This transient nature of the population makes estimating the number of coyotes in a particular area difficult, which, in turn, makes controlling coyote populations difficult.

Coyotes readily adapt to suburban and urban environments once thought unsuitable and they exhibit great plasticity in their behavior and diet. The coyote is arguably the hardiest and most adaptable species on this continent. They are naturally wary of people and will avoid areas in which threats are perceived. They will also become acclimated to humans in the absence of threats, such as hunting and trapping, and in areas where typically unnatural food, such as pet food, garbage and unsupervised small pets, are readily available.

For decades, hounds men have pursued coyotes for sport and in 2003 the General Assembly passed legislation (NCGS § 113 273) allowing controlled fox hunting preserves owners to buy live coyotes and hunt them within the enclosures. The number of licensed trappers and trapping effort varies over time and is largely related to the price paid for pelts in the fur market and prices paid for live animals sold to licensed fox pen enclosures.

Coyotes can be useful in keeping prey species such as rodents and groundhogs in balance with their habitat, and removing feral cats, which negatively impact many wildlife species, especially birds. However, coyotes are currently a focus of attention in N.C. because they also prey on livestock, other wildlife species, such as deer, that are important to our citizens, and domestic pets.

Despite intensive control efforts in other states that have had high coyote populations, they continue to thrive. Historically, bounties have been used in various states as one possible way to control coyotes. In all cases, the use of bounties has been an ineffective and inefficient tool for controlling coyote populations.

Harvest Records and Abundance Data – Current harvest data for foxes and coyotes include estimated take by hunters as derived through hunter harvest surveys of license holders (Table 1), reported take under depredation permits (Table 1), and take by trappers as reported through annual surveys (Table 2). Currently, we have annual data on fox and coyote harvest by trappers; hunter harvest surveys were conducted on average every three years until 2011. Beginning in 2011, the hunter harvest surveys, which include both still hunters and hounds men, are being conducted annually. These annual surveys will allow the Commission to more accurately track harvest by hunters and to improve our estimates of hunting effort. The Commission realizes that not all groups agree with these data, but they provide the most comprehensive information we have on the current status of foxes and coyotes and form a solid basis for Commission conclusions and recommendations provided herein.

Estimates of take by hunters have a large standard error so results must be interpreted with caution, but based on these data there does not appear to be a change in trend for fox harvest by hunters, while harvest of coyotes by

hunters has increased since 2005 (Table 1). Based on these data it also appears that statewide fox harvest under depredation permits varies annually with no clear trend, whereas coyote take under depredation permits continues to increase. Take of foxes by trappers has varied by year peaking in 2007-08 and decreasing since then (Table 2). Take of coyotes by trappers continues to increase (Table 2).

Using these same data, we can compare estimated take between the coastal, piedmont, and mountain regions (Table 3). Based upon these data, take of foxes by hunters and trappers in 2007-08 was similar, but in 2010-11 hunters took substantially more foxes in the piedmont and coastal regions than trappers. Hunters have historically and continue to take significantly more coyotes than trappers.

Many variables influence the number of foxes or coyotes taken by hunters or trappers, including fur prices, the value of an animal on the live market, access, and available time. For foxes, reported take by trappers has closely tracked prices paid for fox pelts (Figure 5). In more recent years, coyotes taken in N.C. have historically been most valuable through sale to controlled fox hunting preserves (i.e., live market). Based on information from preserve operators and trappers during 2011-12, live coyotes sold for between $75 and $125, gray foxes sold for between $25 and $40, and red foxes sold for between $40 and $85.

An important consideration in discussions about the interface between fox and coyote hunters and trappers is the relative take spatially across the landscape. To evaluate this relationship, we compared reported take of foxes by trappers and hunters from our 2010-11 surveys of each constituent group. Based on the results of this comparison (Table 4), it appears that the overall removal of foxes from the landscape by both trappers and hunters is low. For example, in the coastal plain in 2010-11, one fox was removed by a trapper per each 5 mi^2 open to trapping, whereas one fox was removed by a hunter per 10 mi^2 open to fox hunting. Even noting that not all areas in each open county are trapped or hunted, and that over twice as many counties are open to fox hunting, these data are indicative of low trapping or hunting pressure being placed on the fox population across our state. On a finer scale, impact of trappers on the fox resource can also be evaluated by comparing the average number of animals taken by an individual trapper. Using our annual trapper harvest survey data, we compared the average number of coyotes, gray foxes, and red foxes harvested by licensed trappers (Table 5). Based upon these data from 2002-03 through 2010-11, the average take of coyotes by individual trappers has increased, while the take of both gray and red foxes has decreased.

Table 1. Statewide fox and coyote take under depredation permit and hunting, 2002 – 2011.

	Reported Depredation		Hunting[1]			
Year	Estimated Coyote Depredation Take[2]	Estimated Fox Depredation Take[2]	Estimated # Fox Hunters	Estimated Fox Harvest	Estimated # Coyote Hunters	Estimated Coyote Harvest
2002-03	15	289	No Survey Conducted			
2003-04	18	74	No Survey Conducted			
2004-05	28	92	No Survey Conducted			
2005-06	54	143	7,356 (±4,309)	9,808 (±5,337)	19,506 (±3,343)	19,422 (±4,826)
2006-07	37	133	No Survey Conducted			
2007-08	69	184	6,068 (±772)	6,472 (±1,468)	23,967 (±1,487)	36,144 (±6,039)
2008-09	98	121	No Survey Conducted			
2009-10	127	114	No Survey Conducted			
2010-11	38[3]	100[3]	4,960 (±955)	7,416 (±3,242)	32,388 (±2,322)	36,041 (±7,327)

[1] *Estimates are from the voluntary Hunter Harvest Surveys of license holders. The number of hunters and harvest are estimates and based on number of hunters responding to survey. As of 2010-11, hunter harvest surveys are conducted annually. Hunters include both still hunters and hounds men.*

[2] *Based on quarterly reports from Wildlife Damage Control Agents.*

[3] *Not all quarterly reports have been received for 2011, so reported take by Wildlife Damage Control Agents is preliminary.*

Table 2. Statewide fox and coyote take by trappers, 2002 – 2011.

	Trapping				
Year	# Licensed Trappers[1]	Coyote Harvest[2]	Gray Fox Captures[3]	Red Fox Captures[3]	Total Fox[3]
2002-03	1,138	133	1,078	287	1,365
2003-04	1,286	325	2,831	587	3,418
2004-05	1,547	593	2,770	631	3,401
2005-06	1,744	567	2,392	613	3,005
2006-07	1,867	847	3,020	695	3,715
2007-08	2,027	1,434	5,560	1,180	6,740
2008-09	2,233	1,747	4,212	838	5,050
2009-10	2,120	2,092	3,313	769	4,082
2010-11	2,186	2,843	3,995	872	4,867

[1] *Number of licensed trappers based on the sale of resident, county and non-resident trapping licenses during each trapping season.*

[2] *Coyote trapping harvest is based on number reported by licensed trappers responding to the annual voluntary trapper harvest survey.*

[3] *Fox captures are based on annual voluntary trapper harvest survey and include harvested foxes and foxes incidentally captured/released in counties currently closed to fox trapping.*

Table 3. Estimated regional fox and coyote harvest, 2002-03 through 2010-11.

		Fox Harvest				Coyote Harvest			
	Year	Coastal	Piedmont	Mountain	Unknown	Coastal	Piedmont	Mountain	Unknown
Trapping[1]	2002-03	84	0	2	0	Not Surveyed			
	2003-04	2	167	0	0	2	0	0	0
	2004-05	1,947	1,350	72	34	168	211	181	33
	2005-06	1,487	1,397	54	1	159	255	139	0
	2006-07	1,937	1,693	84	1	332	338	177	0
	2007-08	3,930	2,659	99	77	529	547	355	3
	2008-09	2,639	2,043	246	5	608	575	564	0
	2009-10	2,082	1,761	108	98	721	743	330	27
	2010-11	2,666	1,940	196	0	1,100	1,108	603	0
Hunting[2]	2007-08	3,641	2,427	405	0	4,045	16,520	15,579	0
	2010-11	2,432	4,328	642	0	10,261	15,805	9,874	0

[1] *Regional trapping harvest based on annual voluntary survey of all licensed trappers. Survey started in 2002-03. Fox trapping harvest includes harvested foxes and foxes incidentally captured/released in counties closed to fox trapping.*

[2] *Regional hunting harvest estimates based on voluntary hunter harvest survey. No regional harvest estimates available prior to 2007-08.*

Table 4. Estimated regional fox harvest per square mile by licensed trappers and licensed hunters, 2010-11. Area based on counties open to fox trapping (36 counties) and fox hunting (100 counties).

Region	Fox Trapper Harvest[1]	Counties Open to Fox Trapping	Trapper Harvest/mi^2	Fox Hunter Harvest[3]	Counties Open to Fox Hunting	Hunter Harvest/mi^2
Coastal Plain	1,842	15	0.19	2,432	39	0.11
Piedmont	1,357	15	0.60	4,231	37	0.25
Mountains	59	6	0.01	681	24	0.07

[1] *Regional fox trapping harvest based on annual voluntary survey of all licensed trappers.*

[2] *Regional hunting harvest estimates based on voluntary hunter harvest survey of license holder for the 2010-11 season. All counties open to fox hunting either by weapon and/or hound hunting.*

Table 5. Average number of coyotes, gray foxes, and red foxes incidentally captured or harvested by licensed trappers in North Carolina, 2002-03 – 2010-11.

	Captures per Active Trapper[1]		
Year	Coyote	Gray Fox	Red Fox
2002-03	3.5	14.2	4.7
2003-04	3.4	14.8	5.0
2004-05	4.5	13.1	4.6
2005-06	4.2	11.0	4.9
2006-07	4.7	13.5	4.5
2007-08	5.6	17.1	5.1
2008-09	6.4	14.4	4.3
2009-10	6.6	10.0	3.6
2010-11	7.2	11.8	3.7

[1]*Captures per active trapper based on response from the annual voluntary trapper harvest survey conducted of all trapping license holders. Captures include harvested foxes and foxes incidentally captured/released in counties currently closed to fox trapping.*

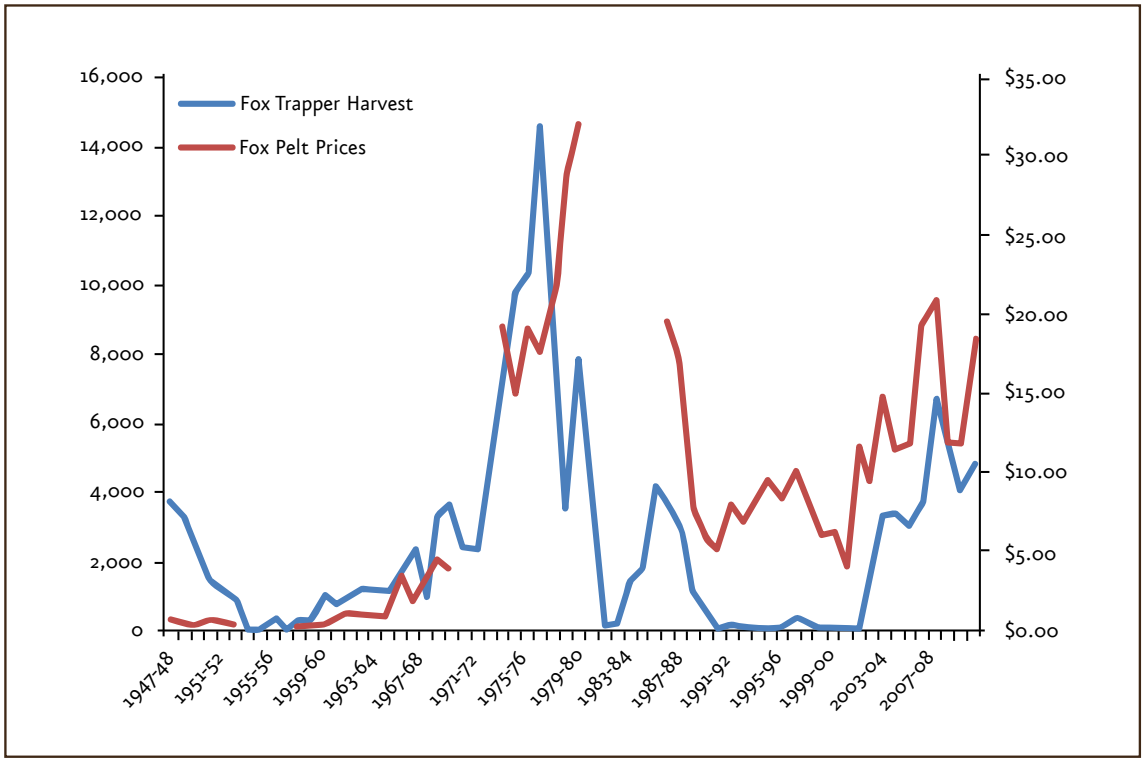

Figure 5. Reported harvest of foxes by trappers and fox pelt prices in North Carolina, 1947 - 2011.

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Increases in human populations, development, and associated land use changes continue rapidly in N.C. Using geospatial analyses, the Conservation Trust for North Carolina (CTNC) projected that by 2030 many areas that were rural in 1940 "will be overtaken by population growth and development such that by 2030, roughly half of the state will be settled at a density equivalent to being urban, suburban, or sprawling exurban" (Figures 6-8). During this time period, the CTNC predicts that there will be a 534% increase in housing units in N.C. Certainly, this level of development will impact all aspects of coyote and fox management in N.C., including the ability of hunters and trappers to pursue these species. Regarding the hunting and trapping of foxes, the Commission believes that this increased development will likely impact opportunities for hunting foxes with dogs more negatively than trapping.

Based upon current human development, the Commission predicted areas across N.C. that may not currently be suitable for fox hunting based on conditions outside of the Commission's control (Figure 9). Areas believed to be unsuitable include federal and state parks and municipalities; and Yancey County where fox hunting is prohibited. Areas of relatively high traffic volume (where the average annual daily traffic volume is greater than the median average annual daily traffic volume) or where human density is relatively high (i.e., greater than one person for every two acres); and water bodies were also excluded. In this predictive analysis, other areas were considered to be suitable for hunting foxes with dogs. In addition, we also predicted counties that may not be suitable for fox hunting but that could be opened to fox trapping.

In this analysis, the Commission made a number of assumptions. We assumed that the traffic below the median value is suitable for fox hunting. Because the median value for traffic volume in N.C. of 210 cars per day averaged over 2010 is considered a low volume of traffic, this assumption is likely true. However, fox hunting could occur at greater traffic volumes. We assumed that human densities greater than one person per two acres is unsuitable for fox hunting. This is a low human density and the assumption is based on previous predictions associated with hunting deer with dogs. It may be that hunting foxes with dogs can be done at higher human densities. Lastly, we assumed that there are no other factors that limit or prohibit fox hunting with dogs. Likely there are many other factors, including landowner attitudes and opinions, which are not accounted for in this analysis. Further studies are required to gain a better understanding of what makes are area suitable or not suitable for hunting foxes with dogs. Counties in which we suggest that trapping could be allowed are those in which at least 25% of the land area is predicted to be unsuitable for hunting foxes with dogs.

Our goal in this analysis is to point out that increases in human development have and will continue to impact hunting foxes with dogs and the Commission and all stakeholders must evaluate these changes and look for possible ways to optimize both hunting and trapping opportunities across space and time.

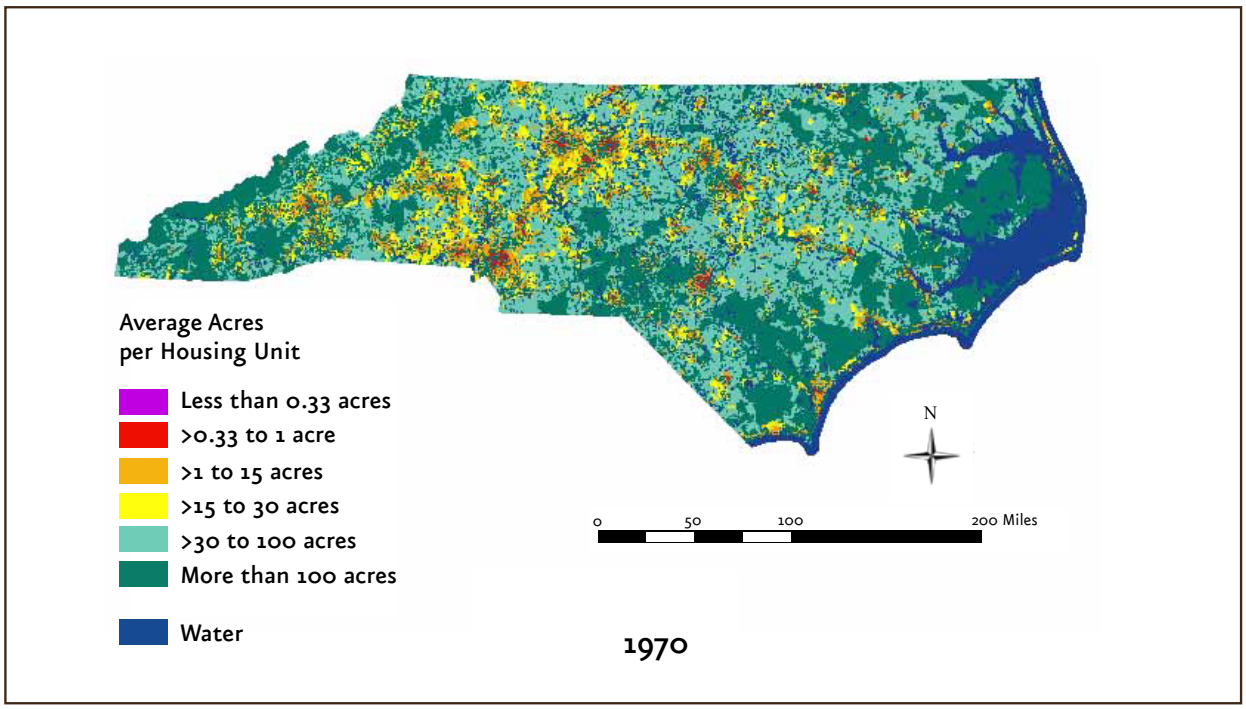

Figure 6. Human housing density in North Carolina, 1970 (from R.B. Hammer and V.C. Radeloff, University of Wisconsin-Madison, courtesy of the Conservation Trust for North Carolina).

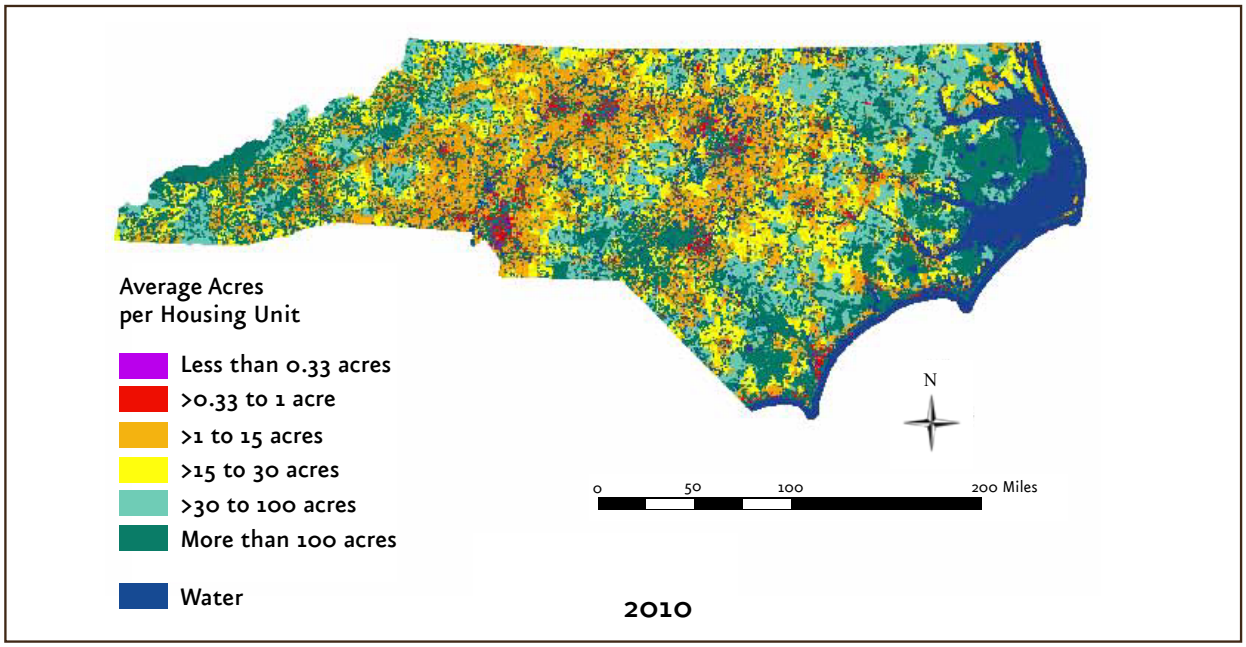

Figure 7. Projected human housing density in North Carolina, 2010 (from R.B. Hammer and V.C. Radeloff, University of Wisconsin-Madison, courtesy of the Conservation Trust for North Carolina).

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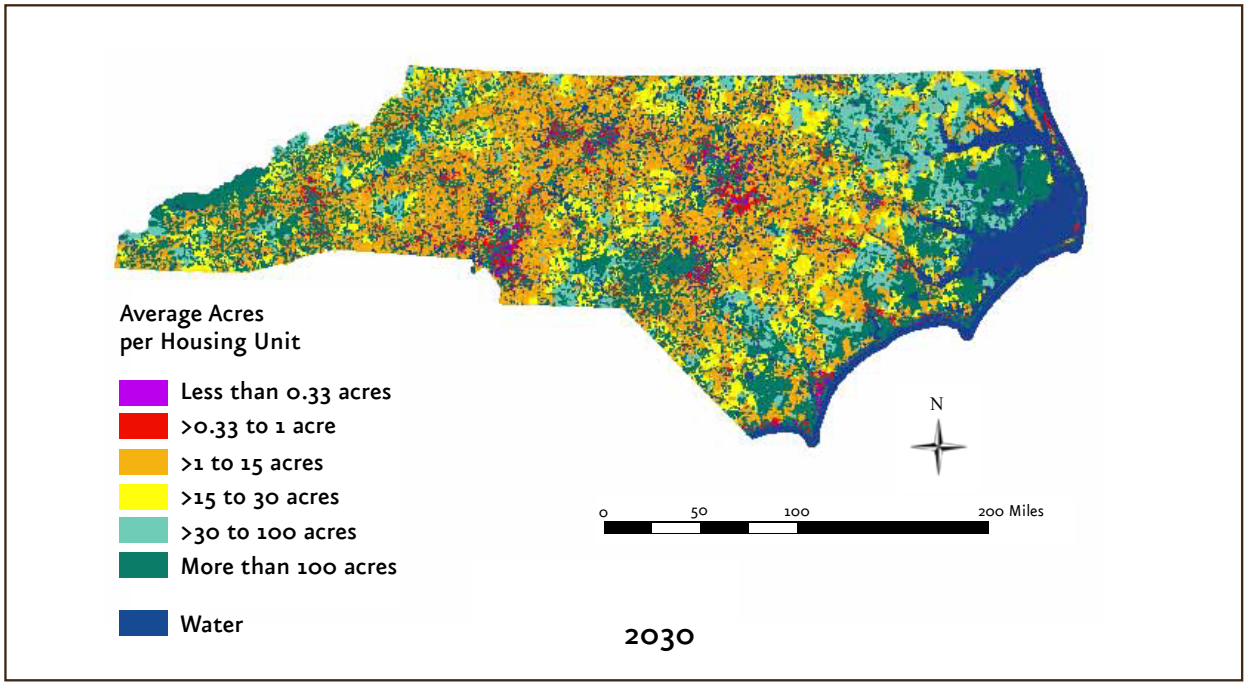

Figure 8. Projected human housing density in North Carolina, 2030 (from R.B. Hammer and V.C. Radeloff, University of Wisconsin-Madison, courtesy of the Conservation Trust for North Carolina).

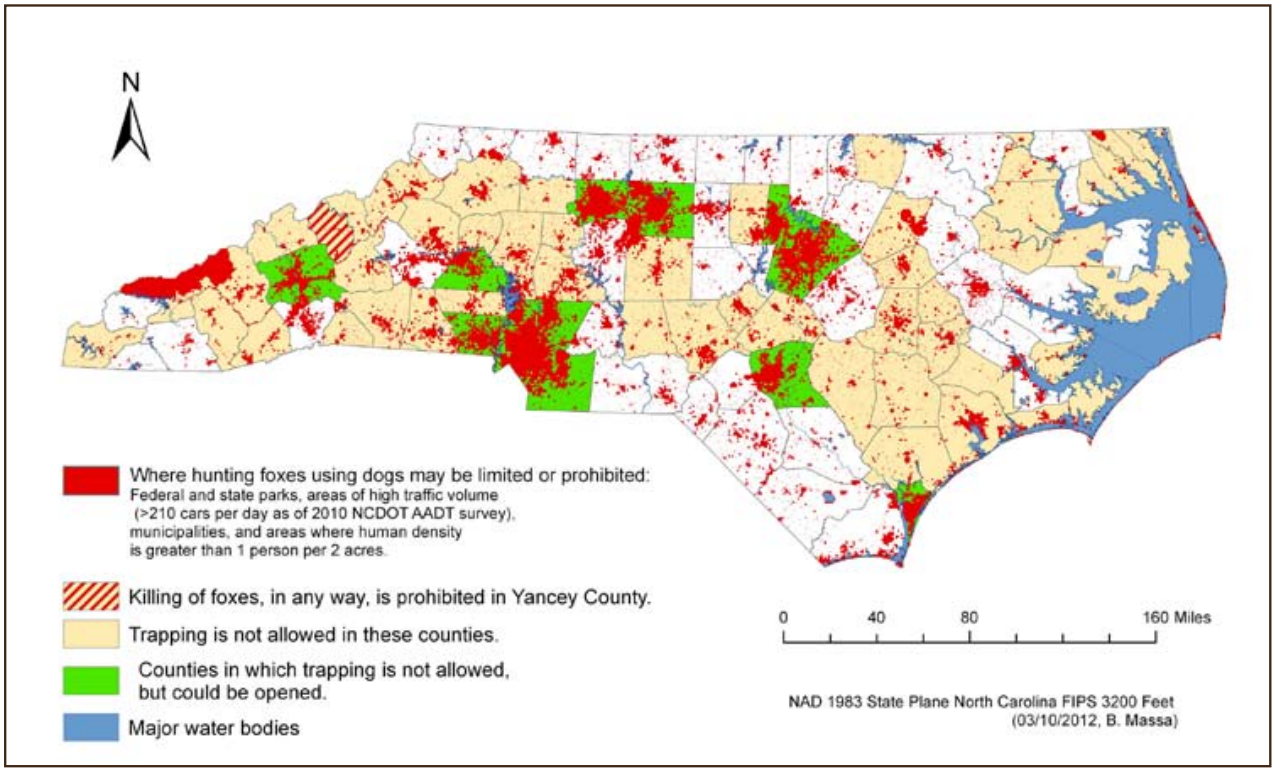

Figure 9. Predicted areas where hunting foxes with dogs may be limited, unsuitable, or prohibited.

STAKEHOLDER FEEDBACK

In efforts to compile information about attitudes and opinions of our constituents on issues related to managing foxes and coyotes, the Commission received invaluable feedback from the direct meetings, and telephone and e-mail surveys. While there were some divergent opinions, generally, trappers, fox hunters, and controlled fox hunting preserve operators believe that issues related to the conservation and management of both foxes and coyotes are important. Other constituents were mostly concerned with what they view as an overabundant and increasing coyote population.

Fox Hunters – Fox hunters do not believe foxes are widely abundant across our state. They believe the Commission caters to trappers and therefore do not trust the Commission to regulate fox harvest. Nor do they trust Commission data regarding the status of fox populations. Fox hunters see trapping as the greatest threat to fox populations. They specifically indicated that they prefer the current scenario where foxes are regulated locally through the General Assembly and oppose transference of regulatory authority over foxes to the Commission.

N.C. Trappers Association – Representatives of the N.C. Trappers Association indicated that they see foxes as a public trust resources and their goal is to have equal access among all constituents to fox resources. They believe that foxes are abundant in most areas of the state, many of which can't support hunting foxes with dogs, but could be trapped. Trappers see opportunities for removing coyotes as a primary reason for establishing a statewide fox trapping season. They recommend listing foxes as furbearers and transferring authority to the Commission for regulating the harvest of foxes using the best available scientific data.

Controlled Fox Hunting Preserve Operators – There were varying opinions among attendees at these two meetings on the most important issues pertaining to conservation of foxes and management of coyotes. In general, they believe preserves positively contribute to fox and coyote management. While many attendees recommended strengthening regulations on operational details of fox hunting preserves, others opposed any additional regulations. Similar to fox hunters, this group also believes that allowing additional fox trapping would be detrimental to fox populations. They believe the best ways to control coyotes is to allow for a longer trapping season for coyotes, to allow them to be shot on sight, and to provide for hunting them at night. While being generally opposed to opening additional trapping opportunities, most attendees acknowledged getting foxes and coyotes from trappers for release into their preserves. Attendees at these meeting also oppose transferring authority to regulate foxes from the General Assembly to the Commission.

Non-governmental Wildlife Organizations – Responses to survey questions from both Quail Unlimited and the Quality Deer Management Association are included in this category. The management of foxes and coyotes is important to both of these organizations. They believe the most important issues related to management of foxes are the timing of seasons, public awareness, trapping regulations, urban development, habitat loss, and gaining additional knowledge about population status. For this group, the most important issues related to management of coyotes are public education, urban development, the inability to use snares, and the need for additional trapping opportunities. Opinions on relative abundance of foxes and coyotes differ. They consistently believe coyotes are too abundant, but that the acceptability of current abundance of foxes depends on the species and location. These groups believe that management of foxes and coyotes is important across the entire state, not just in specific

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areas. When asked about regulatory authority, these groups did not clearly differentiate between the Commission's regulatory authority for coyotes versus the General Assembly's regulatory authority for foxes. These stakeholders are not satisfied with how either foxes or coyotes are being managed in our state and indicated support for increasing opportunities to trap and hunt both species, transferring regulatory authority over foxes to the Commission, increasing options for the public to handle fox and coyote depredations, increasing education and outreach efforts, and increasing coordination and collaboration among agencies, organizations, and the public. Both organizations indicated a strong interest in being involved in future efforts to manage foxes and coyotes in our state.

Non-governmental Agricultural Stakeholders – Responses to survey questions from a goat farmer, horse owner, the N.C. Cattleman's Association, N.C. Cattlemen's Beef Council, and N.C. Farm Bureau are included in this category. While the management of foxes and coyotes is important to all these stakeholders, they clearly consider coyote issues to be of greater importance. They believe the most important issues related to management of foxes and coyotes are disease transmission from foxes, specifically rabies, and predation by coyotes on livestock. Opinions on relative abundance of foxes and coyotes differ. They consistently believe coyotes are too abundant statewide, but they indicated little knowledge or concern about abundance of foxes. When asked about regulatory authority, these groups indicated that they do not know about differences between the Commission's regulatory authority for coyotes and the General Assembly's regulatory authority for foxes. Satisfaction among these stakeholders concerning how foxes and coyotes are being managed in our state also varied. Regarding fox management, respondents supported increasing education and outreach efforts, and increasing coordination and collaboration among agencies, organizations, and the public. Pertaining to coyote management, these stakeholders indicated support for increasing opportunities to trap and hunt coyotes, increasing options for the public to handle fox and coyote depredations, increasing education and outreach efforts, and increasing coordination and collaboration among agencies, organizations, and the public. All respondents indicated a strong interest in being involved in future efforts to manage foxes and coyotes in our state.

N.C. Department of Agriculture and Consumer Services – Responses to survey questions from the Veterinary Services Division and Forest Service are included in this category. The management of foxes and coyotes is important to both of these agencies. They believe the most important issues related to management of foxes and coyotes are balancing all wildlife species, disease transmission, livestock depredation, and habitat protection. These stakeholders believe that both fox and coyote populations are "about right" to "too abundant." These groups believe that management of foxes and coyotes is important across the entire state, especially State Forests. When asked about regulatory authority, these groups clearly understand and differentiate between the Commission's regulatory authority for coyotes versus the General Assembly's regulatory authority for foxes. The Veterinary Services Division is satisfied with how foxes are managed in our state, but the Forest Service is not satisfied. Regarding fox management, the N.C. Forest Service indicated support for increasing opportunities to trap and hunt foxes, transferring regulatory authority over foxes to the Commission, increasing options for the public to handle fox and coyote depredations, increasing education and outreach efforts, and increasing coordination and collaboration among agencies, organizations, and the public. These stakeholders are uniformly dissatisfied with how coyotes are being managed in our state and indicated support for increasing opportunities to trap and hunt coyotes, transferring regulatory authority over foxes to the Commission, increasing options for the public to handle coyote depredations, increasing education and outreach efforts, and increasing coordination and collaboration among agencies, organizations, and the public. Both organizations indicated a strong interest in being involved in future efforts to manage foxes and coyotes in our state.

Public Health Agencies – Responses to survey questions from the N.C. Division of Public Health and N.C. Alliance of Public Health Agencies are included in this category. The management of foxes and coyotes is important to both of these organizations. They believe the most important issues related to management of foxes and coyotes are education and outreach about population status, distribution, and regulations on possession; rabies control; and habitat protection. These stakeholders are unsure about the abundance of foxes but generally believe that coyotes are too abundant. When asked about regulatory authority, these groups' responses indicated that they do not understand differences between the Commission's regulatory authority for coyotes and the General Assembly's regulatory authority for foxes. When asked if they are satisfied with how foxes and coyotes are managed in N.C., they indicated a concern only with public exposure to rabies, but gave no recommendations for improving management activities. Both organizations expressed interest in being involved in future efforts to manage foxes and coyotes in our state.

County Animal Control Agencies – Responses to survey questions from the Orange County Animal Services and Wilkes County Animal Control are included in this category. These constituents believe the most important issues related to management of foxes and coyotes are increasing population of coyotes, rabies control, and safety of pets. Wilkes County Animal Control believes that fox populations are "about right," while coyotes populations are "too abundant." As county animal control agencies, both respondents indicated a focus within their individual county. When asked about regulatory authority, these groups' responses indicated that they do not understand differences between the Commission's regulatory authority for coyotes and the General Assembly's regulatory authority for foxes. When asked if they are satisfied with how foxes and coyotes are managed in N.C., they recommended improving management by increasing education and outreach efforts; increasing coordination and collaboration among agencies, organizations, and the public; controlling population density; and developing a model tracking system. Neither organization expressed interest in being involved in future efforts to manage foxes and coyotes in our state.

RECOMMENDATIONS

Based upon the results of this study as reported herein, we make the following recommendations.

1) Fox trapping seasons vary substantially across our state. There would be significant benefits to establishing a uniform fox trapping season.

Allowing trapping of foxes during the statewide furbearer trapping season would increase the harvest of coyotes. From 2006-2012, the average number of coyotes harvested per county with an established fox trapping season was 31% to 112% higher than in counties without a fox trapping season. From 2004-2011 in Alamance, Ashe, Craven, Davidson, Johnston, and Person counties the average coyote harvest for the two years after opening a fox trapping season increased from 168% to 3,087% from the coyote harvest during the two years immediately prior to opening a fox trapping season.

Inclusion of foxes in the statewide furbearer trapping season would remove regulatory barriers while increasing options available for landowners to resolve fox and coyotes related conflicts. Landowners could manage fox and

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coyote populations locally during trapping season potentially reducing their costs for resolving conflicts.

Allowing the trapping of foxes during furbearer trapping season would simplify regulatory complexity and increase enforcement effectiveness. There are currently 22 unique fox trapping seasons across 38 counties. This regulatory complexity is confusing for our citizens and makes it difficult to interpret local trapping laws.
Finally, allowing the take of foxes during the statewide furbearer trapping season would decrease safety risks to trappers. Where no fox trapping season exists, trappers must place themselves in close proximity to the fox in order to remove it from the trap. If foxes were included in the season, they could be dispatched before being removed from the trap.

Successful wildlife conservation requires effective involvement of stakeholders. In regards to fox hunting and trapping, allocation of resources among constituent groups a critical issue. Neither hunters nor trappers, the primary constituent groups utilizing fox and coyote resources, trust the other, nor do fox hunters trust the Commission. Foxes are state-trust resources, like many other species including deer, turkeys, bears, and rabbits, and as such can be regulated and managed by the Commission pursuant to NCGS § 143-239 in ways that ensure sound resource conservation while addressing wishes of our citizens. Management of foxes by the Commission would require transferring authority from the General Assembly. H**owever, before authority for regulating hunting and trapping of foxes should be transferred to the Commission much of the subjectivity in the current dialogue must be removed by developing a structured decision making process that includes formalized adaptive feedback mechanisms for all regulatory changes. Otherwise, such a transfer of authority is unlikely to be successful. The Commission recommends development of this structured decision making process**.

2) Hunting opportunities should be maintained and, where feasible and appropriate, expanded for both coyotes and foxes. Current efforts by the Commission to establish a night hunting season for coyotes is consistent with the findings of this study.

3) While authority to establish fox trapping seasons is retained by the General Assembly, the Commission recommends that any new or changed fox or coyote trapping season coincide with the current statewide furbearer trapping season (November 1 – February 28).

4) The Commission recommends increased education and outreach regarding Best Management Practices for trapping red foxes, (http://www.fishwildlife.org/files/RedFox_BMP.pdf) gray foxes, (http://www.fishwildlife.org/files/Grayfox_BMP.pdf) and coyotes (http://www.fishwildlife.org/files/EasternCoyote_BMP.pdf).

5) The Commission recommends that the General Assembly amend NCGS § 113.291.1(b)(2) and amend NCGS § 113.291.6 to give the Commission the authority to regulate the use of all gear types in trapping.

6) Activities associated with controlled fox hunting preserves have been of particular interest to numerous stakeholders over recent years. Based on feedback from this study, the Commission, in conjunction with a representative group of preserve operators, will initiate a review of all NCAC rules pertaining to Controlled Fox Hunting Preserves and in situations where opportunities for improvement are identified, initiate rulemaking to effect these changes. This review will include considerations found in the publication “Guidelines for Establishing Hound

Running Pen Regulations with Recommendations to Running Pen Operators for Pen Management" prepared by the Southeastern Association of Fish and Wildlife Agencies' Fur Resources Committee.
In 2013 while this review is being completed, Commission staff will examine rulemaking options for monitoring the sale of live coyotes and foxes to controlled fox hunting preserves, and evaluating disease concerns resulting from increased movement of foxes and coyotes to controlled fox hunting preserves.

7) Although foxes have been a part of our landscape for a very long time, coyotes are a relatively new arrival. As with any newly colonizing species, there is both fact and myth associated with coyotes. In many instances, especially those in urban settings, nuisance situations resulting from interactions between humans and foxes or coyotes can be reduced or eliminated by managing food sources, other attractants, and habitats conditions that attract foxes and coyotes. Coyotes are highly adaptable and most N.C. citizens have very limited exposure to or knowledge about them. They can be a human and wildlife disease vector, and can have significant impacts on livestock, wildlife, and pets. For these reasons, the Commission, working with other stakeholders identified through this study, will develop and initiate an additional education and outreach effort focusing on the biology and status of coyotes in N.C. and the Southeast, approaches for landowners to manage foxes or coyotes on their property, and available options for dealing with negative human/fox/coyote interactions.

8) The Commission's current data collection efforts provide population trend information, but the data are limited with respect to fox or coyote population density in localized areas. We also have limited data on take of foxes or coyotes by hunters, including actual harvest or hunter/trapper effort. The Commission will initiate efforts to reliably determine the status and distribution of foxes and coyotes generally across the state and in specific areas identified by constituents. In addition, an approach for collecting effort data for fox hunters and trappers will be developed. Because 94% of the lands in N.C. are privately owned, the Commission will initiate a human dimensions survey of private landowners and the general public to determine their attitudes and opinions concerning the hunting, trapping, status, and management of foxes and coyotes.

9) A wide range of stakeholders have vested interests in the annual and long-term outcomes of activities that impact fox and coyote populations. With that in mind, the Commission recommends development of a structured process through which stakeholders can collaborate on cooperative approaches to manage these important species. In addition to the Commission, agencies and organizations involved in these efforts should include representatives of the N.C. Department of Agriculture and Consumer Services, N.C. Division of Pub¬lic Health, N.C. Trappers Association, N.C. Wildlife Preserve Association, N.C. Cattlemen's Association, N.C. League of Municipalities, U.S. Fish and Wildlife Service, and the USDA – Wildlife Services.

10) The Commission recommends that the General Assembly consider opening fox trapping seasons to run from November 1 through February 28 in Buncombe, Cabarrus, Catawba, Cumberland, Durham, Forsyth, Gaston, Guilford, Mecklenburg, New Hanover, Union, and Wake counties (Figure 9). Opening these seasons will increase the removal of coyotes and provide opportunities for fox trapping in areas with high human development while limiting the potential for conflicts between fox hunters and fox trappers. This would also allow the Commission to monitor impacts of the removals on distribution and abundance of both foxes and coyotes.

11) The Commission recommends that the General Assembly consider removing prohibitions on hunting and trapping foxes in Yancey County.

APPENDIX A

Questions for Fox Study Stakeholders:

1) Are issues related to the management of foxes and coyotes important to your organization?
   - A) If yes, what are the top three most important issues related to management of foxes?
   - B) If yes, what are the top three most important issues related to management of coyotes?

2) Do you believe fox populations in N.C. are not abundant enough, about right, or too abundant?

3) Do you believe coyote populations in N.C. are not abundant enough, about right, or too abundant?

4) Are there particular areas in the state where fox management is most important to your organization?
   - A) If yes, where?

5) Are there particular areas in the state where coyote management is most important to your organization?
   - A) If yes, where?

6) Are you currently aware of how foxes and coyotes are regulated in N.C.?
   - A) If yes, who is primarily responsible for regulating foxes in N.C.?
   - B) If yes, who is primarily responsible for regulating coyotes in N.C.?

7) Are you satisfied with how foxes are currently managed in N.C.?
   - A) If no, which of these recommendations below do you support to improve management of foxes?
     - i) Increase opportunities to trap foxes
     - ii) Increase opportunities to hunt foxes
     - iii) Transfer complete regulatory authority for foxes to the WRC
     - iv) Increase options for the public to handle depredation by foxes
     - v) Increase education and outreach efforts
     - vi) Increase coordination and collaboration among state agencies, NGOs, and the public
     - vii) Other?

8) Are you satisfied with how coyotes are currently managed in N.C.?
   - A) If no, which of these recommendations below do you support to improve management of coyotes?
     - i) Increase opportunities to trap coyotes
     - ii) Increase opportunities to hunt coyotes
     - iii) Increase options for the public to handle depredation by coyotes
     - iv) Increase education and outreach efforts
     - v) Increase coordination and collaboration among state agencies, NGOs, and the public
     - vi) Other?

9) Would you like to be involved in future efforts to manage foxes and coyotes in N.C.?

Appendix F. County Fox Harvest Seasons Legislated by the General Assembly

COUNTY FOX HARVEST SEASONS LEGISLATED BY THE NORTH CAROLINA GENERAL ASSEMBLY

Updated: July 25th, 2011

DIVISION OF WILDLIFE MANAGEMENT

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

The North Carolina Wildlife Resources Commission (WRC) has very limited authority to regulate fox hunting and trapping seasons. The North Carolina General Assembly (NCGA) has elected to classify foxes only as game animals rather than game and furbearers as bobcat, opossum and raccoon are designated. This classification means that the WRC may not allow foxes to be taken by trapping during regular trapping seasons.

There are numerous statutes that have been approved by the NCGA regulating wildlife related activities. These laws supersede any accompanying rules that have been promulgated by the WRC. Many of these laws passed by the NCGA apply only to a specific county, counties or parts of counties and generally are referred to as "local laws". Some of these laws are listed by county in the WRC's' annual Inland Fishing, Hunting, and Trapping Regulations Digest. The number and complexity of the "local laws" enacted by the NCGA over the past 20 years which allow the taking of foxes with weapons and traps make them unsuitable to include in the annual digest.

This document provides a general listing of current statutes pertaining to allowing the harvest of foxes by the NCGA. It includes all known "local laws" as well as a listing of those counties that fall under the fox firearms season set by G.S. 113-291-4A. "Local laws" which prohibit an activity or harvest are listed in the Regulations Digest.

Chapter 113.
Conservation and Development.
SUBCHAPTER I. GENERAL PROVISIONS.
SUBCHAPTER IV. CONSERVATION OF MARINE AND ESTUARINE AND WILDLIFE RESOURCES.
Article 22.

§ 113-291.4. Regulation of foxes; study of fox and fur-bearer populations.

(a) All of the regulatory powers granted the Wildlife Resources Commission generally with respect to game, wild animals, and wildlife apply to foxes unless there are specific overriding restrictions in this section.

(b) Except for any closed season under subsection (h), foxes may be taken with dogs both night and day on a year-round basis.

(c) Foxes may not be taken with firearms except:
  (1) As provided in subsection (f) or (i) of this section or G.S. 113-291.4A(a).
  (2) As an incidental method of humanely killing them following any lawful method of taking that does not result in death.
  (3) When they are lawfully shot under laws and rules pertaining to the destruction of animals committing depredations to property.

(d) Foxes may not be taken with the aid of any electronic calling device.

(e) The Wildlife Resources Commission is directed to improve its capabilities for studying fox and fur-bearer populations generally and, on the basis of its present knowledge and future studies, to implement management methods and impose controls designed to produce optimum fox and fur-bearer populations in the various areas of the State.

(f) If, on the basis of its studies and other information available, the Wildlife Resources Commission determines the population of foxes in an area is fully adequate to support a harvesting of that population, the Wildlife Resources Commission may, upon passage of local legislation permitting same, open a season for taking foxes by trapping. When the

season is open for trapping, foxes may also be taken by the use of methods lawful for taking game animals, including the use of firearms. Any bag, possession, or season limits imposed on foxes taken from the area in question will apply in the aggregate to all foxes killed without regard to the method of taking.

(f1) In those counties in which open seasons for taking foxes with weapons and by trapping were established between June 18, 1982, and July 1, 1987, in accordance with the procedure then set forth in subsection (f) of this section, the Wildlife Resources Commission is authorized to continue such seasons from year to year so long as the fox populations of such counties remain adequate to support the resulting harvest. The counties referred to in this subsection are as follows: Caswell, Clay, Graham, Henderson, Hyde, Macon, Stokes and Tyrrell.

(g) The Wildlife Resources Commission may provide for the sale of foxes lawfully taken in areas of open season as provided in subsection (f), under a system providing strict controls. The Wildlife Resources Commission must implement a system of tagging foxes and fox furs with a special fox tag, and the Commission may charge two dollars and twenty-five cents ($2.25) for each tag furnished to hunters, trappers, and fur dealers. The fox tag or tags must be procured before taking foxes by any method designed to kill foxes or when the intent is to harvest foxes. The number of tags furnished to any individual may be limited as to area and as to number in accordance with area, bag, possession, or season limits that may be imposed on foxes. No person may continue to hunt or trap foxes under this fox harvesting provision unless he still has at least one valid unused fox tag lawful for use in the area in question. A person hunting foxes with dogs not intending to kill them need not have any fox tag, but any fox accidentally killed by that hunter must be disposed of without sale as provided below, and no foxes not tagged may be sold. The Wildlife Resources Commission may by rule provide reporting and controlled-disposition requirements, not including sale, of foxes killed accidentally by dog hunters, motor vehicles, and in other situations; it may also impose strict controls on the disposition of foxes taken by owners of property under the laws and rules relating to depredations, and authorize sale under controlled conditions of foxes taken under depredation permits.

(h) In any area of the State in which the Wildlife Resources Commission determines that hunting of foxes with dogs has an appreciably harmful effect upon turkey restoration projects, it may declare a closed season for an appropriate length of time upon the taking with dogs of all species of wild animals and birds. Except as otherwise provided in G.S. 113-291.1(d) or (d1), this subsection does not prohibit lawful field trials or the training of dogs.

(i) Upon notification by the State Health Director of the presence of a contagious animal disease in a local fox population, the Commission is authorized to establish such population control measures as are appropriate until notified by public health authorities that the problem is deemed to have passed. (1979, c. 830, s. 1; 1981 (Reg. Sess., 1982), c. 1203, ss. 1-3; 1985, c. 476, s. 2; 1987, c. 726, s. 1, c. 827, s. 98; 1989, c. 504, s. 2, c. 616, s. 4, c. 727, s. 113; 1991, c. 483, s. 1(a), (b); 1993, c. 208, s. 4.)

§ 113-291.4A. Open seasons for taking foxes with firearms.

(a) There is an open season for the taking of foxes with firearms in all areas of the State east of Interstate Highway 77 and in Mitchell and Caldwell Counties from the beginning of the season established by the Wildlife Resources Commission for the taking of rabbits and quail through January 1 of each year. The selling, buying, or possessing for sale of any fox or fox part taken pursuant to this subsection is prohibited, and is punishable as provided by G.S. 113-294(a) or (j).

(b) The Wildlife Resources Commission shall establish appropriate bag and season limits that may be imposed upon the taking of foxes pursuant to this act, and may make reasonable rules governing the possession of foxes killed by motor vehicles or other accidental means. (1989, c. 616, s. 1; 1989 (Reg. Sess., 1990), c. 811; 1995, c. 32, s. 1; 1999-456, s. 32.)

15A NCAC 10B .0212(a)(3) Foxes (Gray and Red)

(a) Seasons.

(1) There shall be no closed season on taking foxes with dogs;

(2) Foxes may be taken with weapons or traps the first to fourth Saturday in January in the following counties:

Caswell	Henderson
Clay	Macon
Graham	Tyrrell

(3) Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by bow and arrow in all areas of the State east of Interstate Highway 77 and in Mitchell County.

(b) Bag Limit.

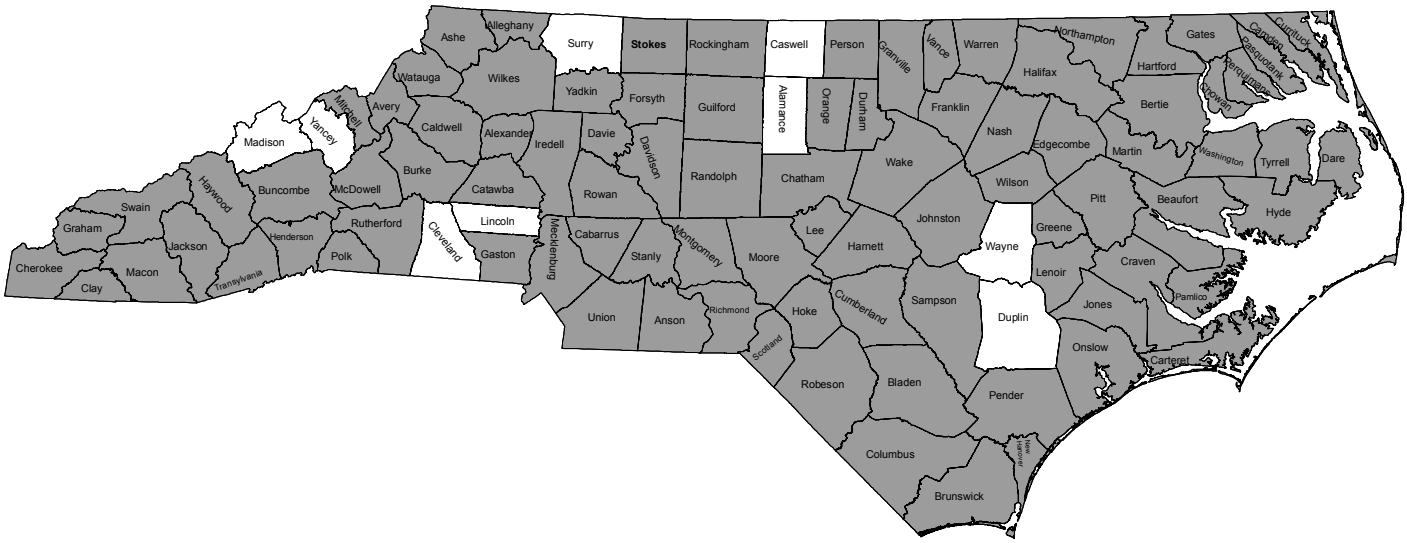
(1) Except in areas of open season for taking foxes with weapons or traps, foxes may not be intentionally killed by any method;

(2) In areas of open season in all areas east of Interstate Highway 77 as set by the Legislature and in Subparagraph (a)(2) and (a)(3) of this Rule, the following bag limit applies: Daily, two; season, 10.

Note: Where local laws governing the taking of foxes conflict with these Regulations, the local laws shall prevail.

Counties with No Closed Season on Taking Foxes with Dogs

Foxes may be taken with dogs both night and day on a daily, year-round basis.



Counties with no restrictions on taking fox with dogs.

Counties with restrictions on taking fox with dogs.

NOTE: See general listing for restrictions in Alamance, Caswell, Cleveland, Duplin, Lincoln, Madison, New Hanover, Surry, Wayne and Yancey counties

Counties with Fox Trapping Seasons

(See general listing for stipulations pertaining to each county.)

Counties and areas with a fox trapping season.
Counties and areas with no fox trapping season.

Counties with Fox Hunting Seasons with Weapons

(See general listing for stipulations pertaining to each county.)

Counties and areas with a fox hunting season.
Counties and areas with no fox hunting season.
NOTE: Restrictions on taking red foxes in Cleveland, Haywood, Lincoln and Madison counties.

Fox Tags: Fox tags are required in all counties with an open season on foxes, unless an exemption is stated in local law.

However, licensed trappers are exempt from tagging requirements if live-trapped foxes are trapped for purpose of sale to licensed controlled fox hunting preserves.

Coyotes: It is legal to trap coyotes during the furbearer trapping seasons established by the Wildlife Resources Commission (WRC). To find out the trapping season in your area, please see page 39 in the WRC Hunting and Trapping regulation digest or visit http://www.ncwildlife.org/Trapping/ and click on "Trapping Regulations."

It is also legal to trap coyotes during any fox-trapping season established by statute or by local law, using methods described in statute, even when those fox-trapping seasons open prior to and extend after the regular trapping seasons.

ALAMANCE

S.L. 1979, c. 825, sec.2 - Prohibits pursuing, hunting, taking or killing deer or foxes with dogs.

S.L. 1989, c.825 - Opens season for taking foxes with weapons during the season for taking rabbits as established by regulation by the Wildlife Resources Commission. Opens season for trapping foxes from January 2 through January 31. A season bag limit of 30 applies in the aggregate to all foxes taken during the weapons and trapping seasons. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

S.L.2008, c. 44, H2123 - Notwithstanding any other provision of law, there is an open season for trapping foxes and coyotes with rubber cleat traps from June 1 through February 28 of each year. The North Carolina Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

ALLEGHENY

S.L. 2011-32, SB46 - Notwithstanding any other provision of law, there is an open season for taking foxes and coyotes with lawful weapons or traps from October 15 through March 1 of each year. No season bag limit applies to foxes and coyotes taken under this act.

ANSON

Former G.S. 113-111, as amended by S.L. 1955, c.286 - Authorized the hunting and killing of foxes at any time by any lawful method. This allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. The 1955 act prohibits importation and release of foxes in the county. Sale of foxes taken under the year-round hunting authorization is not permitted.

S.L. 1989, c.879 - Opens season for taking foxes with weapons from November 18-January 1 each year. Opens season for taking foxes with foothold traps from January 2-January 31 of each year. Wildlife Resources Commission shall provide for the sale of foxes taken pursuant to this act. A season bag limit of 30 applies in the aggregate to all foxes taken.

ASHE

Former G.S. 113-111, as amended by G.S. 113-133.1 (e) - Allows foxes to be taken at any time by any lawful method; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. Sale of foxes taken under this act is not permitted.

S.L. 2007, S364, as amended by S.L. 2010 H1893 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from November 1 through February 28 of each year. A season bag limit of 10 applies in the aggregate to all foxes taken during the trapping season established in this act. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act and pursuant to former G.S. 113-111, as retained to the extent of its application to Ashe County pursuant to G.S. 113-133.1(e).

AVERY

S.L. 1985,c.180 - Authorizes foxes to be taken with weapons from December 1 through February 1 each year, and sets a season bag limit of 30. Wildlife Resources Commission shall provide for the sale of foxes taken pursuant to this act.

BEAUFORT

S.L. 1987, c.98 - Authorized the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate

season bag limit, for both the weapons and trapping season, is ten. The Wildlife Resources Commission shall provide for sale of foxes taken lawfully pursuant to this act.

S.L. 1997,c.132, as amended by S.L. 2001, c. 19 - Authorizes the trapping season for foxes from the day after the close of gun deer season until February 28 of each year. Eliminates the bag limits on hunting or trapping foxes and raccoons and the requirement to tag foxes prior to or after sale. Notwithstanding any other provision of law, foxes and raccoons may be taken during any trapping season established by the Wildlife Resources Commission or by the provisions of this act with steel-jaw or leghold traps with trap chains of up to 18 inches in length.

It is lawful to use snares when trapping fur-bearing animals during seasons for trapping furbearing animals as established by the Wildlife Resources Commission and by the provisions of this act.

BERTIE

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

BLADEN

S.L. 1985,c.722 as amended by S.L. 1985 c. 880 - Permits the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is thirty. The Wildlife Resources Commission shall provide for sale of foxes taken lawfully pursuant to this act.

BRUNSWICK

S.L. 1993, c. 208 - Opens the season for taking foxes with weapons from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

BURKE

S.L. 1989, c.163 - Notwithstanding any other provision of law, there is an open season for hunting, taking, or killing foxes with firearms and bow and arrow during the season for hunting any game animal as established by the Wildlife Resources Commission. Notwithstanding any other provision of law, there is an open season for hunting, taking, or killing foxes by trapping from January 1 through January 31 of each year. The Wildlife Resources Commission shall provide for sale of foxes taken lawfully pursuant to this act.

CABARRUS

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CALDWELL

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CAMDEN

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CARTERET

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CASWELL

P–L.L. 1937, c. 411- Fixes the open season for fox hunting from September 1 to June 30.

S.L. 1991,c.908 as amended by S.L. 1993,c.727 - Notwithstanding any other provision of law, there is an open season for taking foxes with rubber cleat traps from June 1 through February 28 each year. Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from January 5 through February 10 of each year. Notwithstanding any other provision of law, there is an open season for taking foxes with weapons

from November 2 through February 10 of each year. A season bag limit of 30 applies to all foxes taken during the trapping season. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully under this act.

These two acts read together allow hunting foxes with dogs from September 1 through June 30 and allows hunting foxes with weapons from November 2 through February 10.

CATAWBA

Former G.S. 113-111, as amended by S.L. 1955,c.1037 - Authorizes the hunting and killing of foxes at any time by any lawful method. Sale of foxes taken under this act is not permitted.

CHATHAM

S.L. 1995, c.80 - Notwithstanding any other provision of law relating to trapping of foxes, there will be open season for taking foxes with traps of the leghold type no larger than one and one-half, with coil spring and with trap chain and at least three swivels set on dry land with solid anchor. No trap larger than number one and one-half coil spring may be used. This season shall be from December 1 to February 15 of each year. No person shall place traps on the land of another without first obtaining written permission from the landowner or lessee. There shall be no bag limit for foxes taken during the trapping season. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully.

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CHOWAN

Ch. 301 of 1999 S.L. adds Chowan to S.L. 1989,c.128 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons from December 1 through January 1 of each year.

S.L. 2011-40, SB261 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act.

CLAY

G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

CLEVELAND

P.L. 1907, c.388 - Provides an open season on gray foxes from December 2 to the last day of February. Sale of foxes taken under this act is not permitted.

S.L. 1951, c.1101 - Prohibits hunting red foxes at any time.

These two acts read together apparently ban all hunting of red foxes, including with dogs, and opens season for hunting gray foxes during authorized hours by all lawful hunting methods (rifle, shotgun, bow and arrow, and dogs) from December 2 to the last day of February. Sale of harvested foxes is not permitted

COLUMBUS

S.L. 1993, c. 208 amended by S.L. 2004-66, HB 1346 - Opens the season for taking foxes with weapons from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

CRAVEN

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

S.L. 2008, c. 8, S1989 – Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from January 2 through February 28 of each year. No season bag limits applies to foxes taken under this act. The North Carolina Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

CUMBERLAND

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CURRITUCK
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

DARE
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

DAVIDSON
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10.Foxes taken under this season may not be bought or sold.

S.L. 2009, c.43, H551 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act.

DAVIE
G.S. 113-111, as amended by S.L. 1947, c.333 - Authorized the hunting and killing of foxes at any time by any lawful method. The amending law prohibits importation and release of foxes and authorizes the board of county commissioners to pay a bounty on foxes. Sale of harvested foxes is not permitted.

DUPLIN
S.L. 1965,c.774 - Provided an open season from August 2 to March 15 for hunting foxes with dogs, and permits the use of guns and dogs when the season is open for any other game. Sale of foxes taken under this act is not permitted.

DURHAM
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

EDGECOMBE:
S.L. 1991, c.483 s.4 - Opens a season for taking foxes by trapping from January 2 or the last day of deer season, whichever is later, through January 31 of each year. The Wildlife Resources Commission shall provide for sale of foxes. Aggregate bag limit is 30.

FORSYTH
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

FRANKLIN
S.L. 1993, c. 208 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping from October 1 through January 31 each year. The Wildlife Resources Commission shall provide for the sale of lawfully taken foxes.

GATES
S.L. 1989, c.128 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons from December 1 through January 1 of each year. Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from January 2 or the last day of deer season, whichever is later, through January 31 of each year. During this season, all leghold traps set on dry land with solid anchor shall have at least three swivels in the trap chain and no leghold traps larger than size one and one-half may be used. A season bag limit of 30 applies in the aggregate to all foxes taken during the weapons and trapping seasons established in this act. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

GRAHAM
G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

GRANVILLE
S.L. 1963, c.670 - Provides that foxes may be taken by use of dogs year-round, day or night, and by "any manner" during the open season. ("Any manner" should be interpreted to mean during authorized hunting hours by any lawful hunting method in addition to dogs: rifle, shotgun, and bow and arrow. "Open season" should be interpreted to mean when the season is open for any game animal or game bird in the county.)

Sale of foxes taken under this local act is not permitted.

S.L. 1993, c.208 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping from October 1 through January 31 each year. The Wildlife Resources Commission shall provide for the sale of lawfully taken foxes.

GREENE
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

S.L. 1975, c.219, as amended by S.L. 1987, c.132 - Prohibits hunting foxes with firearms "during the two-week deer season."

The current interpretation of this act is that during any gun deer season , the use of firearms to hunt foxes is prohibited.

GUILFORD
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

HALIFAX
P-L.L. 1925, c.571,s.3 - Makes it lawful to "hunt foxes at any time." This should be interpreted to allow year-round dog hunting, day or night (because of the statewide law), and year-round hunting during authorized hunting hours by other normal hunting methods: rifle, shotgun, and bow and arrow. Sale of foxes taken under this act is not permitted.

S.L. 1995, c.279 - Notwithstanding any other law, there is an open season for taking foxes by trapping from January 7 through February 10 of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully under this act. A bag limit of 30 applies in the aggregate to all foxes taken during the fox season established in this act.

HARNETT
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

HAYWOOD
Former G.S. 113-111, as modified by S.L. 1963,c.322 - Provides generally that foxes may be taken "at any time by any lawful method"—but red foxes may not be taken with guns.

This should be interpreted to authorize year-round taking of red foxes with dogs and with bow and arrow, and year-round taking of gray foxes by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (Because of the statewide law, dog hunting of both gray and red foxes may be day or night. Other takings would be limited to authorized hunting hours.) Sale of foxes taken under this act is not permitted.

HENDERSON
Former G.S. 113-111 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.). Sale of foxes taken under this act is not permitted.

G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

HERTFORD
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

HOKE
S.L. 1985, c.108 - Authorizes the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

HYDE
S.L. 1989,c.229 - Notwithstanding any other provision of law, there is a season for taking, hunting, or killing foxes with bow and arrow, rifle, shotgun, and dogs from November 15 through January 1 of each year. Notwithstanding any other provision of law, there is a season for taking, hunting, or killing foxes with traps

from January 2 through the last day of February of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act. A season bag limit of 20 applies in the aggregate to all foxes taken during the fox seasons established in this act.

S.L. 1997,c.132, as amended by S.L. 2001, c. 19 - Authorizes the trapping season for foxes from the day after the close of gun deer season until February 28 of each year. Eliminates the bag limits on hunting or trapping foxes and raccoons and the requirement to tag foxes prior to or after sale. Notwithstanding any other provision of law, foxes and raccoons may be taken during any trapping season established by the Wildlife Resources Commission or by the provisions of this act with steel-jaw or leghold traps with trap chains of up to 18 inches in length.

It is lawful to use snares when trapping fur-bearing animals during seasons for trapping furbearing animals as established by the Wildlife Resources Commission and by the provisions of this act.

IREDELL

S.L. 1985, c.664, H1418 - Provides that foxes may be taken by use of "weapons" in the Townships of Fallstown, Davidson, and Coddle Creek from December 1 through January 1 each year. ("Weapons" would mean rifle, shotgun, and bow and arrow.) The Wildlife Resources Commission must provide for sale of foxes taken legally under the local act.

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold. This applies only to that portion of the county east of I-77.

JOHNSTON

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

S.L. 2007, H1185 - Notwithstanding any other provision of law, there is an open season from December 1 through February 20 of each year for taking foxes with weapons and by trapping, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act.

JONES

S.L. 1989, c.134 - Notwithstanding any other provision of law, there is a season for taking, hunting, or killing of foxes with firearms from November 1 through December 31 of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

LEE

S.L. 1977, c. 636 - Classifies the fox as a game animal which may be taken only with dogs at any time during day or night and prohibits the purchase or sale of foxes or parts thereof, except for live foxes for restocking purposes.

LENOIR

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

LINCOLN

P–L.L. 1925, c. 449, sections 1 and 2 - Provides an open season for hunting red foxes with dogs only from October 1 to March 1.

S.L. 1955, c.878 - Provides that one may "hunt, take or kill gray foxes at any time..." This should be interpreted to allow year-round hunting of gray foxes, day or night (because of statewide law); year-round hunting of gray foxes during authorized hunting hours with shotgun, rifle, and bow and arrow; and day and night hunting of red foxes with dogs from October 1 to March 1. Sale of foxes taken under this act is not permitted.

MACON

G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

MADISON

S.L. 1951, c. 1040- Prohibits hunting red foxes at any time.

MARTIN

S.L. 1977, c. 636 - Classifies the fox as a game animal which may be taken only with dogs at any time during the day or night, and prohibits the purchase or sale of foxes or parts thereof, except for live foxes for restocking purposes.

MECKLENBURG

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate

Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold. This applies only to that portion of the county east of I-77.

MITCHELL

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

MONTGOMERY

S.L. 1977, c.1142,s1 - Provides that (1) there is "no closed season for hunting foxes with dogs or guns"; (2) it is unlawful to "buy or sell a dead fox, fox pelt or other part of a fox"; and(3) foxes may be taken with dogs during the day or night. (The specification of "dogs or guns" would prevent use of the bow and arrow.)

MOORE

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

NASH

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

NEW HANOVER

S.L. 1971, c.559 - Prohibits hunting foxes with dogs in that portion of Federal Point Township which lies south of Snow's Cut (the Intracoastal Waterway).

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

NORTHAMPTON

S.L. 1993, c.727 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from January 5 through February 10 of each year. Notwithstanding any other provision of law, there is an open season for taking foxes with weapons from November 2 through February 10 of each year. No provisions for sale are provided.

ONSLOW

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

ORANGE

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

PAMLICO

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

PASQUOTANK

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

PENDER

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

PERQUIMANS

Former G.S. 113-111 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.) Sale of foxes taken under this act is not permitted.

PERSON

S.L. 1985,c.108, as amended by S. O. 1985 (2nd Sess. 1986), c.890 and further amended by house bill 820 in 2005 - Authorizes the taking of foxes

by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from September 1 through September 30 and from December 1 through February 20 of each year. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one half may be used. There is no season bag limit. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

PITT
S.L. 1993, c. 208 amended by S.L. 2004-199, SB 1225 - Opens the season for taking foxes with weapons from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

RANDOLPH
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

RICHMOND
S.L. 2001, c. 133, H903 - Notwithstanding any other provision of law, there is a season for taking foxes with box-type traps only from January 2 through January 31 of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act. A season bag limit of 30 applies in the aggregate to gray and red foxes taken during the fox season established in this act. This act applies only to that portion of Richmond County located north of U.S. Highway 74 and west of U.S. Highway 1.

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

ROBESON
S.L. 1985, c.108 - Authorizes the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

ROCKINGHAM
S.L. 1985, c.179, as amended by S.L. 2011-136, HB463 - Authorizes the taking of foxes by firearms, bow and arrow, or crossbow during any open small game season each year. There is an open season for taking foxes by trapping from November 1 through February 28 of each year. During this season, all leghold traps set on dry shall be in accordance with State law. No bag limit applies to foxes taken under this act. No tags shall be required for the sale of the fur of foxes taken in accordance with this act.

ROWAN
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

SAMPSON
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

SCOTLAND
S.L. 1985, c.108 - Authorizes the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The local act applies in that portion of Scotland County northeast of N.C. Highway 381 from the Richmond County line to the South Carolina border. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10.

Foxes taken under this season may not be bought or sold.

STANLY
S.L. 1989,c.879 - Opens season for taking foxes with weapons from November 18-January 1 of each year. Opens season for taking foxes with foothold traps from January 2-January 31 of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken pursuant to this act. A season bag limit of 10 applies in the aggregate to all foxes taken.

STOKES
Former G.S. 113-111, as amended by S.L. 1955, c.685 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.). The sale of foxes taken under this act is not permitted.

S.L. 2008, c. 102. H2760 – Notwithstanding any other provision of law, there is an open season from the first Saturday in January through the last Saturday in January of each year for taking foxes with weapons and by trapping, with no tagging requirements prior to or after sale. No bag limits applies to foxes taken under this act.

SURRY
P-L. L. 1925,c.474,s.6 - Provides that gray and red foxes may be taken only from October 15 through March 1. This should be interpreted to authorize fox hunting with dogs, day and night, during the open season, and normal hunting methods: rifle, shotgun, and bow and arrow. The sale of foxes taken under this act is not permitted.

S.L. 2011-32, SB46 - Notwithstanding any other provision of law, there is an open season for taking foxes and coyotes with lawful weapons or traps from October 15 through March 1 of each year. No season bag limit applies to foxes and coyotes taken under this act.

TYRRELL
Former G.S. 113-111 - Allows foxes to be taken "at any time by any lawful method"' this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs.(Sale under this provision is not permitted).

G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

UNION
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

VANCE
S.L. 1993, c. 208 as amended by S.L. 2004-44 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping from October 1 through January 31 each year. The Wildlife Resources Commission shall provide for the sale of lawfully taken foxes.

WAKE
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WARREN
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WASHINGTON
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WAYNE
S.L. 1981, c. 697, as amended by S.L. 1987, c. 958 - Prohibits hunting foxes in any manner from March 16 to August 1. Amendment exempts persons training dogs to hunt foxes in a dog training facility larger than 500 acres that is enclosed with a dog-proof fence.

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WILKES

Former G.S. 113-111, as amended by S.L. 1971, c.385 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.) The 1971 act prohibits the use of electronic calling devices in taking foxes in Wilkes County. The sale of foxes taken under this act is not permitted.

WILSON

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WINSTON-SALEM

S.L. 2010, H1893 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping with cage traps only during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act.

YADKIN

Former G.S. 113-111, as amended by S.L. 1953,c.199 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.) The 1953 act prohibits importation and release of foxes in Yadkin County. The sale of foxes taken under this act is not permitted.

YANCY

S.L. 1965, c. 522 - Prohibits killing foxes in any manner.

Appendix F. County Fox Harvest Seasons Legislated by the General Assembly

COUNTY FOX HARVEST SEASONS LEGISLATED BY THE NORTH CAROLINA GENERAL ASSEMBLY

Updated: July 2017

DIVISION OF WILDLIFE MANAGEMENT

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

"How do I find out if I can hunt or trap foxes in my county?"

The state law regarding foxes, coupled with the diversity of local laws, has resulted in 27 fox hunting seasons with weapons in 85 counties, and 23 fox trapping seasons in 43 counties.

This document was created to help guide sportsmen on the legal aspects of taking foxes. It provides maps and a table indicating which counties are open or closed to fox hunting and/or trapping. In addition, a listing of current statutes and local laws by county is included starting on page 12.

The North Carolina Wildlife Resources Commission (WRC) has very limited authority to regulate fox hunting and trapping seasons. Only the General Assembly has the authority to allow fox trapping in a county through passage of a local law. The North Carolina General Assembly (NCGA) has elected to classify foxes only as a game animals rather than game and furbearers as bobcat, opossum and raccoon are designated (§ 113 291.4). This classification means that the WRC may not allow foxes to be taken by trapping during regular trapping seasons.

There are numerous session laws that have been approved by the NCGA relating to foxes. Many of these laws passed by the NCGA apply only to a specific county, counties or parts of counties and generally are referred to as "local laws". The number and complexity of the "local laws" enacted by the NCGA over the past 40 years which allow the taking of foxes with weapons and traps make them unsuitable to include in the annual regulations digest, thus this separate document was created.

Tagging Requirements for both Hunters and Trappers

Fox Tags: It is unlawful to buy, sell, barter, trade, or otherwise transfer possession or ownership of the carcass or pelt of any fox without having affixed to such carcass or pelt an individual fox tag. **To purchase fox tags, please call 1-888-248-6834.**

A fox tag or tags must be procured *before* taking foxes by any method designed to kill foxes or when the intent is to harvest foxes in the following counties:

- Clay
- Graham
- Henderson
- Macon
- Tyrrell

Fox Tag Exemptions: Licensed trappers are exempt from tagging requirements if live-trapped foxes are trapped for purpose of sale to licensed controlled fox hunting preserves.

Trappers are exempt from fox tagging requirements in the following counties/areas:

- Beaufort
- Chowan
- Cherokee
- Davidson
- Davie
- Hyde
- Johnston
- New Hanover
- Rockingham
- Stokes
- Wilkes
- Winston-Salem
- Yadkin

Counties with Fox Trapping Seasons

(See general listing for stipulations pertaining to each county.)

Counties and areas with a fox trapping season.
Counties and areas with no fox trapping season.

Counties with Fox Hunting Seasons with Weapons

(See general listing for stipulations pertaining to each county.)

Counties and areas with a fox hunting season.
Counties and areas with no fox hunting season.
NOTE: Restrictions on taking red foxes in Cleveland, Haywood, Lincoln and Madison counties.

Counties with No Closed Season on Taking Foxes with Dogs

Foxes may be taken with dogs both night and day on a daily, year-round basis.

Counties with no restrictions on taking fox with dogs.

Counties with restrictions/prohibitions on taking fox with dogs.

NOTE: See general listing for restrictions in Alamance, Caswell, Cleveland, Duplin, Lincoln, Madison, New Hanover, Surry, Wayne and Yancey counties

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Coyotes: It is legal to trap coyotes during the regulated trapping seasons established by the Wildlife Resources Commission (WRC). To find out the trapping season in your area, please see page 38 in the WRC Hunting and Trapping regulation digest or visit http://www.ncwildlife.org/Trapping/ and click on "Seasons & Limits."

It is also legal to trap coyotes during any fox-trapping season established by statute or by local law, using methods described in statute, even when those fox-trapping seasons open prior to and extend after the regulated trapping seasons.

All counties in North Carolina are listed in this table and are in alphabetical order. Due to space constraints in this table, please see general listings on page 12 for specific stipulations for your county.

	Fox Trapping Season		Fox Hunting Season w/Weapon	
County	**Dates**	**Local Restrictions**	**Dates**	**Local Restrictions**
Alamance County	Jan. 2 -Jan. 31	Season bag limit=30 (aggregate of hunting & trapping)	Nov. 18 – end. of Feb.	Season bag limit=30 (aggregate of hunting & trapping)
	Jun. 1 - Feb. 28	Rubber cleat traps required		
Alexander County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Alleghany County	Oct. 15 - Mar. 1		Oct. 15 - Mar. 1	
Anson County	Jan. 2 -Jan. 31	Season bag limit=30 (aggregate of hunting & trapping)	Nov. 18 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping)
			Year-round	Sale of foxes prohibited
Ashe County	Nov. 1 - Feb. 28	Bag limit=10	Year-round	Sale of foxes prohibited
Avery County	No Fox Trapping Season		Dec. 1 - Feb. 1	Season bag limit=30
Beaufort County	Dec. 1 – Jan. 1	Foothold traps must have trap chains no longer than 18 inches in length	Dec. 1 - Jan. 1	
	Jan. 2 – end of Feb.			
Bertie County	No Fox Trapping Season		Nov. 19 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Bladen County	Jan. 2- Jan. 31	Foothold traps must ≤ 1.5 in size & have 3 swivels in trap chain Season bag limit=30 (aggregate of hunting & trapping)	Dec. 1 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping)
Brunswick County	Jan. 2- Jan. 31	Foothold traps must ≤ 1.5 in size & have 3 swivels in trap chain Season bag limit=30 (aggregate of hunting & trapping)	Dec. 1 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping)
Buncombe County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Burke County	Jan. 1 - Jan. 31		During any season for a game animal	

	Fox Trapping Season		Fox Hunting Season w/Weapon	
County	**Dates**	**Local Restrictions**	**Dates**	**Local Restrictions**
Cabarrus County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Caldwell County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Camden County	No Fox Trapping Season		Nov.18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Carteret County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Caswell County	Jun. 1 - Feb. 28	Rubber cleat traps required Season bag limit=30	Nov. 2 - Feb. 10	
Catawba County	No Fox Trapping Season		Year-round	Sale of foxes prohibited
Chatham County	Dec. 1 - Feb. 15	Foothold traps must ≤ 1.5 in size w/coil spring & have 3 swivels in trap chain	Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Cherokee County	Nov. 1 – end of Feb.		No Fox Hunting Season w/Weapon	
Chowan County	Dec. 1 – end of Feb.		Dec. 1 – end of Feb.	
Clay County	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited
Cleveland County	No Fox Trapping Season		Dec. 2 - end of Feb.	Gray Foxes only Sale of foxes prohibited
Columbus County	Jan. 2 - Jan. 31	Foothold traps must ≤ 1.5 in size & have 3 swivels in trap chain Season bag limit=30 (aggregate of hunting & trapping)	Dec. 1 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping)
Craven County	Jan. 2 - Feb. 28		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Cumberland County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited

	Fox Trapping Season		Fox Hunting Season w/Weapon	
County	**Dates**	**Local Restrictions**	**Dates**	**Local Restrictions**
Currituck County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Dare County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Davidson County	Nov. 1 - end of Feb.		Nov. 1 - end of Feb.	
Davie County	Oct. 1 – Feb. 28		Year-round	Sale of foxes prohibited
Duplin County	No Fox Trapping Season		During any open season for a game animal	Sale of foxes prohibited
Durham County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Edgecombe County	Jan. 2 - Jan. 31	Season bag limit=30 (aggregate of hunting & trapping)	Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Forsyth County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Franklin County	Oct. 1 - Jan. 31		Oct. 1 - Jan. 31	
Gaston County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Gates County	Jan. 2 - Jan. 31	Foothold traps must ≤ 1.5 in size & have 3 swivels in trap chain Season bag limit=30 (aggregate of hunting & trapping)	Dec. 1 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping)
Graham County	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited
Granville County	Oct. 1 - Jan. 31		Oct. 1 - Jan. 31	
			During any open season for game birds or animal	Sale of foxes is prohibited

	Fox Trapping Season		Fox Hunting Season w/Weapon	
County	**Dates**	**Local Restrictions**	**Dates**	**Local Restrictions**
Greene County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited Use of firearm to hunt foxes prohibited during deer gun season
Guilford County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Halifax County	Jan. 7 - Feb. 10	Season bag limit=30	Year-round	Sale of foxes prohibited
Harnett County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Haywood County	No Fox Trapping Season		Year-round for gray foxes by any normal hunting means	Sale of foxes prohibited
			Year-round for red foxes only w/archery or dogs	Sale of foxes prohibited
Henderson County	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited
			Year-round	Sale of foxes prohibited
Hertford County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Hoke County	Jan. 2 - Jan. 31	Foothold traps must ≤ 1.5 in size & have 3 swivels in trap chain Season bag limit=30 (aggregate of hunting & trapping)	Dec. 1 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping)
Hyde County	Dec. 1 – Jan. 2	Foothold traps must have trap chains no longer than 18 inches in length	Nov. 15 - Jan. 1	
	Jan. 2 – end of Feb.			

	Fox Trapping Season		Fox Hunting Season w/Weapon	
County	**Dates**	**Local Restrictions**	**Dates**	**Local Restrictions**
Iredell County	No Fox Trapping Season		Dec. 1 - Jan. 1	Only in Fallstown, Davidson, and Coddle Creek townships
			Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Jackson County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Johnston County	Dec. 1 - Feb. 20		Dec. 1 - Feb. 20	
Jones County	No Fox Trapping Season		Nov. 1 - Dec. 31	Firearm only
Lee County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Lenoir County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Lincoln County	No Fox Trapping Season		Year-round	Gray Foxes only
				Sale of foxes prohibited
McDowell County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Macon County	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited
Madison County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Martin County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Mecklenburg County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Mitchell County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Montgomery County	No Fox Trapping Season		Year-round	Dogs or guns only
Moore County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Nash County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited

	Fox Trapping Season		Fox Hunting Season w/Weapon	
County	**Dates**	**Local Restrictions**	**Dates**	**Local Restrictions**
New Hanover County	Dec. 1 – end of Feb.		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Northampton County	Jan. 5 - Feb. 10		Nov. 2 - Feb. 10	
Onslow County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Orange County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Pamlico County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Pasquotank County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Pender County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Perquimans County	No Fox Trapping Season		Year-round	Sale of foxes prohibited
Person County	Sept. 1 – Sept. 30 & Dec. 1 – Feb. 20	Foothold traps must ≤ 1.5 in size & have 3 swivels in trap chain	Dec. 1 - Jan. 1	
Pitt County	Jan. 2 - Jan. 31	Foothold traps must ≤ 1.5 in size & have 3 swivels in trap chain Season bag limit=30 (aggregate of hunting & trapping)	Dec. 1 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping)
Polk County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Randolph County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Richmond County	Jan. 2 - Jan. 31	Box Traps Only Season limit=30	Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited

	Fox Trapping Season		Fox Hunting Season w/Weapon	
County	**Dates**	**Restrictions**	**Dates**	**Restrictions**
Robeson County	Jan. 2 - Jan. 31	Leghold traps must ≤ 1.5 in size & have 3 swivels in trap chain Season bag limit=30 (aggregate of hunting & trapping)	Dec. 1 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping)
Rockingham County	Nov. 1 - Feb. 28		Oct. 16 – end of Feb.	
Rowan County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Rutherford County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Sampson County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Scotland County	Jan. 2 - Jan. 31	Leghold traps must ≤ 1.5 in size & have 3 swivels in trap chain Season bag limit=30 (aggregate of hunting & trapping) Only in portion northeast of N.C. Hwy. 381	Dec. 1 - Jan. 1	Season bag limit=30 (aggregate of hunting & trapping) Only in portion northeast of N.C. Hwy. 381
			Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Stanly County	Jan. 2 - Jan. 31	Season bag limit=10 (aggregate of hunting & trapping) Foothold traps only	Nov. 18 - Jan. 1	Season bag limit=10 (aggregate of hunting & trapping)
Stokes County	Jan. 6 - Jan. 27		Jan. 6 - Jan. 27	
			Year-round	Sale of foxes prohibited
Surry County	Oct. 15 - Mar. 1		Oct. 15 - Mar. 1	Sale of foxes prohibited
Swain County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Transylvania County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	

	Fox Trapping Season		Fox Hunting Season w/Weapon	
County	**Dates**	**Restrictions**	**Dates**	**Restrictions**
Tyrrell County	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited	Jan. 6 - Jan. 27	Daily bag limit=2 Season bag limit=10 Sale of live foxes prohibited
			Year-round	Sale of foxes prohibited
Union County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Vance County	Oct. 1 - Jan. 31		Oct. 1 - Jan. 31	
Wake County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Warren County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Washington County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Watauga County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	
Wayne County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Wilkes County	Nov. 1 – end of Feb.		Year-round	Sale of foxes prohibited
Wilson County	No Fox Trapping Season		Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited
Winston-Salem	Nov. 1 – end of Feb.	Cage Traps Only	Nov. 18 - Jan. 1	Daily bag limit=2 Season bag limit=10 Sale of foxes prohibited Local Firearm Discharge Ordinances Applies
Yadkin County	Oct. 1 – Feb. 28		Year-round	Sale of foxes prohibited
Yancey County	No Fox Trapping Season		No Fox Hunting Season w/Weapon	

Counties are listed in alphabetical order. If your county is not listed, you cannot trap or hunt foxes with a weapon in your county.

ALAMANCE

S.L. 1979, c. 825, sec.2 - Prohibits pursuing, hunting, taking or killing deer or foxes with dogs.

S.L. 1989, c.825 - Opens season for taking foxes with weapons during the season for taking rabbits as established by regulation by the Wildlife Resources Commission. Opens season for trapping foxes from January 2 through January 31. A season bag limit of 30 applies in the aggregate to all foxes taken during the weapons and trapping seasons. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

S.L.2008, c. 44, H2123 - Notwithstanding any other provision of law, there is an open season for trapping foxes and coyotes with rubber cleat traps from June 1 through February 28 of each year. The North Carolina Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

ALLEGHENY

S.L. 2011-32, SB46 - Notwithstanding any other provision of law, there is an open season for taking foxes and coyotes with lawful weapons or traps from October 15 through March 1 of each year. No season bag limit applies to foxes and coyotes taken under this act.

ANSON

Former G.S. 113-111, as amended by S.L. 1955, c.286 - Authorized the hunting and killing of foxes at any time by any lawful method. This allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. The 1955 act prohibits importation and release of foxes in the county. Sale of foxes taken under the year-round hunting authorization is not permitted.

ANSON

S.L. 1989, c.879 - Opens season for taking foxes with weapons from November 18-January 1 each year. Opens season for taking foxes with foothold traps from January 2-January 31 of each year. Wildlife Resources Commission shall provide for the sale of foxes taken pursuant to this act. A season bag limit of 30 applies in the aggregate to all foxes taken.

ASHE

Former G.S. 113-111, as amended by G.S. 113-133.1 (e) - Allows foxes to be taken at any time by any lawful method; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. Sale of foxes taken under this act is not permitted.

S.L. 2007, S364, as amended by S.L. 2010 H1893 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from November 1 through February 28 of each year. A season bag limit of 10 applies in the aggregate to all foxes taken during the trapping season established in this act. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act and pursuant to former G.S. 113-111, as retained to the extent of its application to Ashe County pursuant to G.S. 113-133.1(e).

AVERY

S.L. 1985,c.180 - Authorizes foxes to be taken with weapons from December 1 through February 1 each year, and sets a season bag limit of 30. Wildlife Resources Commission shall provide for the sale of foxes taken pursuant to this act.

BEAUFORT

S.L. 1987, c.98 - Authorized the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is ten. The Wildlife Resources Commission shall provide for sale of foxes taken lawfully pursuant to this act.

S.L. 1997,c.132, as amended by S.L. 2001, c. 19 - Authorizes the trapping season for foxes from the day after the close of gun deer season until February 28 of each year. Eliminates the bag limits on hunting or trapping foxes and raccoons and the requirement to tag foxes prior to or after sale. Notwithstanding any other provision of law, foxes and raccoons may be taken during any trapping season established by the Wildlife Resources Commission or by the provisions of this act with steel-jaw or leghold traps with trap chains of up to 18 inches in length.

It is lawful to use snares when trapping fur-bearing animals during seasons for trapping furbearing animals as established by the Wildlife Resources Commission and by the provisions of this act.

BERTIE

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

BLADEN
S.L. 1985,c.722 as amended by S.L. 1985 c. 880 - Permits the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is thirty. The Wildlife Resources Commission shall provide for sale of foxes taken lawfully pursuant to this act.

BRUNSWICK
S.L. 1993, c. 208 - Opens the season for taking foxes with weapons from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

BURKE
S.L. 1989, c.163 - Notwithstanding any other provision of law, there is an open season for hunting, taking, or killing foxes with firearms and bow and arrow during the season for hunting any game animal as established by the Wildlife Resources Commission. Notwithstanding any other provision of law, there is an open season for hunting, taking, or killing foxes by trapping from January 1 through January 31 of each year. The Wildlife Resources Commission shall provide for sale of foxes taken lawfully pursuant to this act.

CABARRUS
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CALDWELL
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CAMDEN
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CARTERET
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CASWELL
P–L.L. 1937, c. 411- Fixes the open season for fox hunting from September 1 to June 30.

S.L. 1991,c.908 as amended by S.L. 1993,c.727 - Notwithstanding any other provision of law, there is an open season for taking foxes with rubber cleat traps from June 1 through February 28 each year. Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from January 5 through February 10 of each year. Notwithstanding any other provision of law, there is an open season for taking foxes with weapons from November 2 through February 10 of each year. A season bag limit of 30 applies to all foxes taken during the trapping season. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully under this act.

These two acts read together allow hunting foxes with dogs from September 1 through June 30 and allows hunting foxes with weapons from November 2 through February 10.

CATAWBA
Former G.S. 113-111, as amended by S.L. 1955,c.1037 - Authorizes the hunting and killing of foxes at any time by any lawful method. Sale of foxes taken under this act is not permitted.

CHATHAM
S.L. 1995, c.80 - Notwithstanding any other provision of law relating to trapping of foxes, there will be open season for taking foxes with traps of the leghold type no larger than one and one-half, with coil spring and with trap chain and at least three swivels set on dry land with solid anchor. No trap larger than number one and one-half coil spring may be used. This season shall be from December 1 to February 15 of each year. No person shall place traps on the land of another without first obtaining written permission from the landowner or lessee. There shall be no bag limit for foxes taken during the trapping season. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully.

CHATHAM continued…
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CHEROKEE
S.L. 2015-13, HB 65 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

CHOWAN
Ch. 301 of 1999 S.L. adds Chowan to S.L. 1989,c.128 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons from December 1 through January 1 of each year.

S.L. 2011-40, SB261 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act.

CLAY
G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

CLEVELAND
P.L. 1907, c.388 - Provides an open season on gray foxes from December 2 to the last day of February. Sale of foxes taken under this act is not permitted.

S.L. 1951, c.1101 - Prohibits hunting red foxes at any time.

These two acts read together apparently ban all hunting of red foxes, including with dogs, and opens season for hunting gray foxes during authorized hours by all lawful hunting methods (rifle, shotgun, bow and arrow, and dogs) from December 2 to the last day of February. Sale of harvested foxes is not permitted

COLUMBUS
S.L. 1993, c. 208 amended by S.L. 2004-66, HB 1346 - Opens the season for taking foxes with weapons from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

CRAVEN
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

S.L. 2008, c. 8, S1989 – Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from January 2 through February 28 of each year. No season bag limits applies to foxes taken under this act. The North Carolina Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

CUMBERLAND
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

CURRITUCK
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

DARE
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

DAVIDSON
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

DAVIDSON continued…
S.L. 2009, c.43, H551 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act.

DAVIE
S.L. 2017-73, HB272 – Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from October 1 through February 28 of each year, with no tagging requirements prior to or after sale. No bag limits applies to foxes taken under this act. The North Carolina Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

G.S. 113-111, as amended by S.L. 1947, c.333 - Authorized the hunting and killing of foxes at any time by any lawful method. The amending law prohibits importation and release of foxes and authorizes the board of county commissioners to pay a bounty on foxes. Sale of harvested foxes is not permitted.

DUPLIN
S.L. 1965,c.774 - Provided an open season from August 2 to March 15 for hunting foxes with dogs, and permits the use of guns and dogs when the season is open for any other game. Sale of foxes taken under this act is not permitted.

DURHAM
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

EDGECOMBE:
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

S.L. 1991, c.483 s.4 - Opens a season for taking foxes by trapping from January 2 or the last day of deer season, whichever is later, through January 31 of each year. The Wildlife Resources Commission shall provide for sale of foxes. Aggregate bag limit is 30.

FORSYTH
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

FRANKLIN
S.L. 1993, c. 208 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping from October 1 through January 31 each year. The Wildlife Resources Commission shall provide for the sale of lawfully taken foxes.

GATES
S.L. 1989, c.128 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons from December 1 through January 1 of each year. Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from January 2 or the last day of deer season, whichever is later, through January 31 of each year. During this season, all leghold traps set on dry land with solid anchor shall have at least three swivels in the trap chain and no leghold traps larger than size one and one-half may be used. A season bag limit of 30 applies in the aggregate to all foxes taken during the weapons and trapping seasons established in this act. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

GRAHAM
G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

GRANVILLE
S.L. 1963, c.670 - Provides that foxes may be taken by use of dogs year-round, day or night, and by "any manner" during the open season. ("Any manner" should be interpreted to mean during authorized hunting hours by any lawful hunting method in addition to dogs: rifle, shotgun, and bow and arrow. "Open season" should be interpreted to mean when the season is open for any game animal or game bird in the county.) Sale of foxes taken under this local act is not permitted.

S.L. 1993, c.208 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping from October 1 through January 31 each year. The Wildlife Resources Commission shall provide for the sale of lawfully taken foxes.

GREENE
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by

GREENE continued…
firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

S.L. 1975, c.219, as amended by S.L. 1987, c.132 - Prohibits hunting foxes with firearms "during the two-week deer season."

The current interpretation of this act is that during any gun deer season, the use of firearms to hunt foxes is prohibited.

GUILFORD
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

HALIFAX
P-L.L. 1925, c.571,s.3 - Makes it lawful to "hunt foxes at any time." This should be interpreted to allow year-round dog hunting, day or night (because of the statewide law), and year-round hunting during authorized hunting hours by other normal hunting methods: rifle, shotgun, and bow and arrow. Sale of foxes taken under this act is not permitted.

S.L. 1995, c.279 - Notwithstanding any other law, there is an open season for taking foxes by trapping from January 7 through February 10 of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully under this act. A bag limit of 30 applies in the aggregate to all foxes taken during the fox season established in this act.

HARNETT
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

HAYWOOD
Former G.S. 113-111, as modified by S.L. 1963,c.322 - Provides generally that foxes may be taken "at any time by any lawful method"—but red foxes may not be taken with guns.

This should be interpreted to authorize year-round taking of red foxes with dogs and with bow and arrow, and year-round taking of gray foxes by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (Because of the statewide law, dog hunting of both gray and red foxes may be day or night. Other takings would be limited to authorized hunting hours.) Sale of foxes taken under this act is not permitted.

HENDERSON
Former G.S. 113-111 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.). Sale of foxes taken under this act is not permitted.

G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

HERTFORD
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

HOKE
S.L. 1985, c.108 - Authorizes the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

HYDE
S.L. 1989,c.229 - Notwithstanding any other provision of law, there is a season for taking, hunting, or killing foxes with bow and arrow, rifle, shotgun, and dogs from November 15 through January 1 of each year. Notwithstanding any other provision of law, there is a season for taking, hunting, or killing foxes with traps from January 2 through the last day of February of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act. A season bag limit of 20 applies in the aggregate to all foxes taken during the fox seasons established in this act.

S.L. 1997,c.132, as amended by S.L. 2001, c. 19 - Authorizes the trapping season for foxes from the day after the close of gun deer season until February 28 of each year. Eliminates the bag limits on hunting or trapping foxes and raccoons and the

requirement to tag foxes prior to or after sale. Notwithstanding any other provision of law, foxes and raccoons may be taken during any trapping season established by the Wildlife Resources Commission or by the provisions of this act with steel-jaw or leghold traps with trap chains of up to 18 inches in length.

It is lawful to use snares when trapping fur-bearing animals during seasons for trapping furbearing animals as established by the Wildlife Resources Commission and by the provisions of this act.

IREDELL

S.L. 1985, c.664, H1418 - Provides that foxes may be taken by use of "weapons" in the Townships of Fallstown, Davidson, and Coddle Creek from December 1 through January 1 each year. ("Weapons" would mean rifle, shotgun, and bow and arrow.) The Wildlife Resources Commission must provide for sale of foxes taken legally under the local act.

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold. This applies only to that portion of the county east of I-77.

JOHNSTON

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

S.L. 2007, H1185 - Notwithstanding any other provision of law, there is an open season from December 1 through February 20 of each year for taking foxes with weapons and by trapping, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act.

JONES

S.L. 1989, c.134 - Notwithstanding any other provision of law, there is a season for taking, hunting, or killing of foxes with firearms from November 1 through December 31 of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

LEE

S.L. 1977, c. 636 - Classifies the fox as a game animal which may be taken only with dogs at any time during day or night and prohibits the purchase or sale of foxes or parts thereof, except for live foxes for restocking purposes.

LENOIR

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

LINCOLN

P–L.L. 1925, c. 449, sections 1 and 2 - Provides an open season for hunting red foxes with dogs only from October 1 to March 1.

S.L. 1955, c.878 - Provides that one may "hunt, take or kill gray foxes at any time..." This should be interpreted to allow year-round hunting of gray foxes, day or night (because of statewide law); year-round hunting of gray foxes during authorized hunting hours with shotgun, rifle, and bow and arrow; and day and night hunting of red foxes with dogs from October 1 to March 1. Sale of foxes taken under this act is not permitted.

MACON

G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

MADISON

S.L. 1951, c. 1040- Prohibits hunting red foxes at any time.

MARTIN

S.L. 1977, c. 636 - Classifies the fox as a game animal which may be taken only with dogs at any time during the day or night, and prohibits the purchase or sale of foxes or parts thereof, except for live foxes for restocking purposes.

MECKLENBURG

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold. This applies only to that portion of the county east of I-77.

MITCHELL

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

MONTGOMERY
S.L. 1977, c.1142,s1 - Provides that (1) there is "no closed season for hunting foxes with dogs or guns"; (2) it is unlawful to "buy or sell a dead fox, fox pelt or other part of a fox"; and(3) foxes may be taken with dogs during the day or night. (The specification of "dogs or guns" would prevent use of the bow and arrow.)

MOORE
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all Areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

NASH
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

NEW HANOVER
S.L. 1971, c.559 - Prohibits hunting foxes with dogs in that portion of Federal Point Township which lies south of Snow's Cut (the Intracoastal Waterway).

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

NEW HANOVER
S.L. 2015-13, HB 65 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

NORTHAMPTON
S.L. 1993, c.727 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from January 5 through February 10 of each year. Notwithstanding any other provision of law, there is an open season for taking foxes with weapons from November 2 through February 10 of each year.

ONSLOW
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

ORANGE
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

PAMLICO
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

PASQUOTANK
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

PENDER
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

PERQUIMANS
Former G.S. 113-111 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.) Sale of foxes taken under this act is not permitted.

PERSON
S.L. 1985,c.108, as amended by S. O. 1985 (2nd Sess. 1986), c.890 and further amended by house bill 820 in 2005 - Authorizes the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from September 1 through September 30 and from December 1 through February 20 of each year. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain,

PERSON continued…
and no leghold trap larger than size one and one half may be used. There is no season bag limit. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

PITT
S.L. 1993, c. 208 amended by S.L. 2004-199, SB 1225 - Opens the season for taking foxes with weapons from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

RANDOLPH
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

RICHMOND
S.L. 2001, c. 133, H903 - Notwithstanding any other provision of law, there is a season for taking foxes with box-type traps only from January 2 through January 31 of each year. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act. A season bag limit of 30 applies in the aggregate to gray and red foxes taken during the fox season established in this act. This act applies only to that portion of Richmond County located north of U.S. Highway 74 and west of U.S. Highway 1.

RICHMOND
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

ROBESON
S.L. 1985, c.108 - Authorizes the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

ROCKINGHAM
S.L. 1985, c.179, as amended by S.L. 2011-136, HB463 - Authorizes the taking of foxes by firearms, bow and arrow, or crossbow during any open small game season each year. There is an open season for taking foxes by trapping from November 1 through February 28 of each year. During this season, all leghold traps set on dry shall be in accordance with State law. No bag limit applies to foxes taken under this act. No tags shall be required for the sale of the fur of foxes taken in accordance with this act.

ROWAN
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

SAMPSON
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

SCOTLAND
S.L. 1985, c.108 - Authorizes the taking of foxes by rifle, shotgun, and bow and arrow from December 1 through January 1, and by trapping from January 2 through January 31. Leghold traps set on dry land with solid anchor must have at least three swivels in the trap chain, and no leghold trap larger than size one and one-half may be used. The aggregate season bag limit, for both the weapons and trapping season, is 30. The local act applies in that portion of Scotland County northeast of N.C. Highway 381 from the Richmond County line to the South Carolina border. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

STANLY
S.L. 1989, c.879 - Opens season for taking foxes with weapons from November 18-January 1 of each year. Opens season for taking foxes with foothold traps from January 2-January 31 of each year. The Wildlife Resources Commission…

STANLY continued…
shall provide for the sale of foxes taken pursuant to this act. A season bag limit of 10 applies in the aggregate to all foxes taken.

STOKES
Former G.S. 113-111, as amended by S.L. 1955, c.685 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.). The sale of foxes taken under this act is not permitted.

S.L. 2008, c. 102. H2760 – Notwithstanding any other provision of law, there is an open season from the first Saturday in January through the last Saturday in January of each year for taking foxes with weapons and by trapping, with no tagging requirements prior to or after sale. No bag limits applies to foxes taken under this act.

SURRY
P-L. L. 1925, c.474,s.6 - Provides that gray and red foxes may be taken only from October 15 through March 1. This should be interpreted to authorize fox hunting with dogs, day and night, during the open season, and normal hunting methods: rifle, shotgun, and bow and arrow. The sale of foxes taken under this act is not permitted.

S.L. 2011-32, SB46 - Notwithstanding any other provision of law, there is an open season for taking foxes and coyotes with lawful weapons or traps from October 15 through March 1 of each year. No season bag limit applies to foxes and coyotes taken under this act.

TYRRELL
Former G.S. 113-111 - Allows foxes to be taken "at any time by any lawful method"' this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (Sale under this provision is not permitted).

G.S. 113-291.4, (f), (f1), and (g) – Opens a special permit season from the first to the fourth Saturday in January with traps or weapons with a daily bag limit of 2 and a season bag limit of 10. Permit holder must have fox tags in possession prior to taking of foxes that must be tagged prior to sale. Sale of live foxes under this statute is not permitted.

UNION
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

VANCE
S.L. 1993, c. 208 as amended by S.L. 2004-44 - Notwithstanding any other provision of law, there is an open season for taking foxes with weapons and by trapping from October 1 through January 31 each year. The Wildlife Resources Commission shall provide for the sale of lawfully taken foxes.

WAKE
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WARREN
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WASHINGTON
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WAYNE
S.L. 1981, c. 697, as amended by S.L. 1987, c. 958 - Prohibits hunting foxes in any manner from March 16 to August 1. Amendment exempts persons training dogs to hunt foxes in a dog training facility larger than 500 acres that is enclosed with a dog-proof fence.

15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WILKES
Former G.S. 113-111, as amended by S.L. 1971, c.385 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.) The 1971 act prohibits the use of electronic calling devices in taking foxes in Wilkes County. The sale of foxes taken under this act is not permitted

WILKES continued…
S.L. 2015-13, HB 65 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act. The Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

WILSON
15A NCAC 10B .0212 - Foxes may be taken the Saturday next preceding Thanksgiving through January 1 by firearms or bow and arrow in all areas of the State east of Interstate Highway 77 and in Caldwell and Mitchell Counties with a daily bag limit of 2 and season limit of 10. Foxes taken under this season may not be bought or sold.

WINSTON-SALEM
S.L. 2010, H1893 - Notwithstanding any other provision of law, there is an open season for taking foxes by trapping with cage traps only during the trapping season set by the Wildlife Resources Commission each year, with no tagging requirements prior to or after sale. No bag limit applies to foxes taken under this act.

YADKIN
S.L. 2017-73, HB272 – Notwithstanding any other provision of law, there is an open season for taking foxes by trapping from October 1 through February 28 of each year, with no tagging requirements prior to or after sale. No bag limits applies to foxes taken under this act. The North Carolina Wildlife Resources Commission shall provide for the sale of foxes taken lawfully pursuant to this act.

YADKIN
Former G.S. 113-111, as amended by S.L. 1953,c.199 - Allows foxes to be taken "at any time by any lawful method"; this allows year-round taking during authorized hunting hours by normal hunting methods: rifle, shotgun, bow and arrow, and dogs. (The statewide law would allow dog hunting at night.) The 1953 act prohibits importation and release of foxes in Yadkin County. The sale of foxes taken under this act is not permitted.

YANCY
S.L. 1965, c. 522 - Prohibits killing foxes in any manner.

Appendix G. Cooperative Service Agreement between the Commission and APHIS WS

WS-ER (6/15)

Agreement No.: 17-7237-5332 RA
WBS Element: AP.RA.RX37.72.0174

COOPERATIVE SERVICE AGREEMENT
between
NORTH CAROLINA WILDLIFE RESOURCES COMMISSION (NC WRC)
and
UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES (APHIS WS)

ARTICLE 1

The purpose of this Cooperative Service Agreement is to provide the NC WRC with predator management services to protect rare, threatened, and endangered avian, mammalian, amphibian, and reptilian species on public and private lands within the coastal counties of North Carolina. APHIS WS activities are described in the Work and Financial Plans (Attachments A and B).

ARTICLE 2

APHIS WS has statutory authority under the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C.426-426b) as amended, and the Act of December 22, 1987 (101Stat. 1329-331, 7 U.S.C. 426c), to cooperate with States, local jurisdictions, individuals, public and private agencies, organizations, and institutions while conducting a program of wildlife services involving mammal and bird species that are reservoirs for zoonotic diseases, or animal species that are injurious and/or a nuisance to, among other things, agriculture, horticulture, forestry, animal husbandry, wildlife, and human health and safety.

ARTICLE 3

APHIS WS and NC WRC mutually agree:

1. The parties' authorized representatives who shall be responsible for carrying out the provisions of this Agreement shall be:

NC WRC:	Gordon Myers, Executive Director NCSU Centennial Campus 1751 Varsity Dr. Raleigh, NC 27606
APHIS WS:	USDA APHIS WS Keith P Wehner, State Director 6213-E Angus Drive Raleigh, NC 27617

2. To meet as determined necessary by either party to discuss mutual program interests, accomplishments, needs, technology, and procedures to maintain or amend the Work Plan (Attachment A). Personnel authorized to attend meetings under this Agreement shall be NC WRC Executive Director or his designee, the State Director or his designee, and/or those additional persons authorized and approved by the NC WRC Executive Director, and the State Director.

3. APHIS WS shall perform services more fully set forth in the Work Plan (Attachment A), which is attached hereto and made a part hereof. The parties may mutually agree in writing, at any time during the term of this Agreement, to amend, modify, add or delete services from the Work Plan.

ARTICLE 4

NC WRC agrees:

1. To authorize APHIS WS to conduct direct control activities to protect threatened and endangered birds, reptiles and mammals throughout the coastal counties of North Carolina. These activities are defined in the Work Plan (Attachment A). APHIS WS will be considered an invitee on the lands controlled by NC WRC. NC WRC will be required to exercise reasonable care to warn APHIS WS as to dangerous conditions or activities in the project areas.

2. To reimburse APHIS WS for actual costs of services provided under this Agreement up to but not exceeding the amount specified in the Financial Plan (Attachment B). NC WRC will begin processing for payment invoices submitted by APHIS WS within 30 days of receipt. The NC WRC ensures and certifies that it is not currently debarred or suspended and is free of delinquent Federal debt.

3. To designate to APHIS WS the NC WRC authorized individual whose responsibility shall be the coordination and administration of activities conducted pursuant to this Agreement.

4. To notify APHIS WS verbally or in writing as far in advance as practical of the date and time of any proposed meeting related to the program.

5. APHIS WS shall be responsible for administration and supervision of the program.

6. There will be no equipment with a procurement price of $5,000 or more per unit purchased directly with funds from the cooperator for use solely on this project. All other equipment purchased for the program is and will remain the property of APHIS WS.

7. To coordinate with APHIS WS before responding to all media requests.

ARTICLE 5

APHIS WS Agrees:

1. To conduct activities on public and private lands as described in the Work and Financial Plans.

2. Designate to NC WRC the authorized APHIS WS individual who shall be responsible for the joint administration of the activities conducted pursuant to this Agreement.

3. To bill NC WRC for actual costs incurred by APHIS WS during the performance of services agreed upon and specified in the Work Plan. APHIS WS shall keep records and receipts of all reimbursable expenditures hereunder for a period of not less than one year from the date of completion of the services provided under this Agreement and NC WRC shall have the right to inspect and audit such records.

4. To obtain the appropriate state and federal permits for all wildlife removal activities, including consultation with U.S. Fish and Wildlife Service on disposition of any canid captured in Beaufort, Dare, Hyde, Tyrrell, and Washington counties.

5. During and for three years after the term hereof, the State Auditor and NC WRC shall have access to persons and records related to this agreement to verify accounts and data affecting fees or performance, as provided in N.C.G.S. 143-49(9).

6. To coordinate with NC WRC before responding to all media requests.

ARTICLE 6

This Agreement is contingent upon the passage by Congress of an appropriation from which expenditures may be legally met and shall not obligate APHIS WS upon failure of Congress to so appropriate. This Agreement may also be reduced or terminated if Congress only provides APHIS WS funds for a finite period under a Continuing Resolution.

ARTICLE 7

APHIS WS assumes no liability for any actions or activities conducted under this Cooperative Service Agreement except to the extent that recourse or remedies are provided by Congress under the Federal Tort Claims Act (28 U.S.C. 1346(b), 2401(b), and 2671-2680).

ARTICLE 8

Pursuant to Section 22, Title 41, United States Code, no member of or delegate to Congress shall be admitted to any share or part of this Agreement or to any benefit to arise therefrom.

ARTICLE 9

Nothing in this Agreement shall prevent APHIS WS from entering into separate agreements with any other organization or individual for the purpose of providing wildlife damage management services exclusive of those provided for under this agreement.

ARTICLE 10

NC WRC certifies that APHIS WS has advised NC WRC that there may be private sector service providers available to provide wildlife management services that NC WRC is seeking from APHIS WS.

ARTICLE 11

The performance of wildlife damage management actions by APHIS WS under this agreement is contingent upon a determination by APHIS WS that such actions are in compliance with the National Environmental Policy Act, Endangered Species Act, and any other applicable federal statutes. APHIS WS will not make a final decision to conduct requested wildlife damage management actions until it has made the determination of such compliance.

ARTICLE 12

This Cooperative Service Agreement may be amended at any time by mutual agreement of the parties in writing. Also, this Agreement may be terminated at any time by mutual agreement of the parties in writing, or by one party provided that party notifies the other in writing at least 120 days prior to effecting such action. Further, in the event the NC WRC does not provide necessary funds, APHIS WS is relieved of the obligation to provide services under this agreement.

ARTICLE 13

This document and any documents incorporated specifically by reference represent the entire agreement between the parties. This document, Work Initiation Documents signed by both parties, and the attachments hereto are incorporated as though set forth verbatim.

ARTICLE 14

The work for this agreement shall be conducted in North Carolina. Legal conflicts that cannot be resolved otherwise will be brought before a federal court with jurisdiction in North Carolina.

In accordance with the Debt Collection Improvement Act of 1996, the Department of Treasury requires a **Taxpayer Identification Number** for individuals or businesses conducting business with the agency.

NC WRC Taxpayer Identification Number (TIN) 73-6502734

NC WILDLIFE RESOURCES COMMISSION

BY: _____ 7-12-2017
Gordon Myers, Executive Director — Date
1751 Varsity Drive
Raleigh, NC 27606

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

BY: _____ 7/12/2017
Keith P. Wehner, State Director — Date
USDA APHIS WS
6213-E Angus Drive
Raleigh, NC 27617

BY: _____ 7/14/2017
Janet L. Bucknall — Date
Director, Eastern Region
USDA APHIS WS
920 Main Campus Drive, Suite 200
Raleigh, NC 27606

ATTACHMENT A
WORK PLAN

Introduction

The U.S. Department of Agriculture (USDA) is authorized to protect American agriculture and other resources from damage associated with wildlife. The primary authority for APHIS WS is the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C.426-426b) as amended, and the Act of December 22, 1987 (101Stat. 1329-331, 7 U.S.C. 426c). Wildlife Services activities are conducted in cooperation with other Federal, State and local agencies; private organizations and individuals.

The APHIS WS program uses an Integrated Wildlife Damage Management (IWDM) approach in which a series of methods may be used or recommended to reduce wildlife damage. IWDM is described in Chapter 1, 1-7 of the Animal Damage Control Program Final Environmental Impact Statement (USDA, 1994). These methods include the alteration of cultural practices as well as habitat and behavioral modification to prevent damage. However, controlling wildlife damage may require that the offending animal(s) are killed or that the populations of the offending species be reduced.

Purpose

NC WRC has requested assistance from APHIS-WS in controlling predators along North Carolina's coastal counties to protect rare, threatened, and endangered species, including but not limited to shore-nesting birds and nesting sea turtles.

Planned APHIS WS Activities

APHIS WS will use an IWDM approach to manage predator damage throughout North Carolina coastal counties. Individual projects will be initiated and conducted at the written request of the NC WRC Technical Point of Contact in collaboration with US Fish and Wildlife Services personnel, as needed.

Effective Dates

The agreement shall become effective on July 12, 2017 and shall expire on June 30, 2018.

ATTACHMENT B
FINANCIAL PLAN

Personnel Costs	$31,450
Travel	$2,500
Vehicle Usage	$4,373
Supplies/Equipment	$1,000
Subtotal (Direct Costs)	$39,323
Pooled Job Costs (11%)	$4,326
Indirect Costs (16.15%)	$6,351
TOTAL	$50,000

The distribution of the budget from this Financial Plan may vary as necessary to accomplish the purpose of this agreement, but may not exceed $50,000.

Financial Point of Contact

NC WRC: Gordon Myers (919) 707-0050

APHIS WS: Catherine Saunders, Budget Analyst (919) 326-6917

Technical Point of Contact

NC WRC: Kyle Briggs (919) 707-0016

Appendix H. Red Wolf Settlement Agreement

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
NORTHERN DIVISION

CASE NO.: 2:13-CV-60-BO

RED WOLF COALITION, DEFENDERS OF WILDLIFE, and ANIMAL WELFARE INSTITUTE, Plaintiffs, v. JIM COGDELL, JOHN LITTON CLARK, JOE C. BARKER, III, WES SEEGARS, NAT T. HARRIS, JR., JOSEPH BUDD, DAVID W. HOYLE, JR., WENDELL (DELL) MURPHY, MARK CRAIG, THOMAS A. BERRY, GARRY SPENCE, JOHN T. COLEY, IV, VERNON (RAY) CLIFTON, JR., THOMAS L. FONVILLE, RICHARD EDWARDS, MICHELL HICKS, TIMOTHY L. SPEAR, in their official capacities as Commissioners of the North Carolina Wildlife Resources Commission; GORDON S. MYERS, in his official capacity as Executive Director of the North Carolina Wildlife Resources Commission, Defendants.	)	**SETTLEMENT AGREEMENT**

This Settlement Agreement ("Agreement") is entered into by and between Plaintiffs RED WOLF COALITION, DEFENDERS OF WILDLIFE, AND ANIMAL WELFARE INSTITUTE and Defendants JIM COGDELL, JOHN LITTON CLARK, JOE C. BARKER, III, WES SEEGARS, NAT T. HARRIS, JR., JOSEPH BUDD, DAVID W. HOYLE, JR., WENDELL (DELL) MURPHY, MARK CRAIG, THOMAS A. BERRY, GARRY SPENCE, JOHN T.

COLEY, IV, VERNON (RAY) CLIFTON, JR., THOMAS L. FONVILLE, RICHARD EDWARDS, MICHELL HICKS, TIMOTHY L. SPEAR, in their official capacities as Commissioners of the North Carolina Wildlife Resources Commission ("NCWRC") and GORDON S. MYERS, in his official capacity as Executive Director of the NCWRC:

WHEREAS, in 1967, the red wolf was designated an endangered species under the Endangered Species Preservation Act of 1966, the precursor to the federal Endangered Species Act of 1973 ("ESA"), 16 U.S.C. §§ 1531 et seq.;

WHEREAS, in 1987, four pairs of red wolves bred in captivity were released into the Alligator River National Wildlife Refuge in eastern North Carolina as a nonessential experimental population under Section 10(j) of the ESA, 16 U.S.C. § 1539(j);

WHEREAS, in the Complaint, Plaintiffs contend that Defendants are in violation of the ESA by authorizing coyote hunting in Dare, Hyde, Tyrrell, Beaufort, and Washington counties (hereinafter, "Red Wolf Recovery Area");

WHEREAS, the NCWRC has worked with the United States Fish and Wildlife Service ("USFWS") to broaden collaboration in the conservation and management of all canid species, including red wolves, on the Albemarle Peninsula;

WHEREAS, the NCWRC has the authority to regulate hunting of non-endangered wildlife in the State of North Carolina and has used this authority to allow the hunting of coyotes;

WHEREAS, Defendants contend that the Court lacks jurisdiction over them on various grounds including sovereign immunity and lack of subject matter jurisdiction, and further contend that they are not in violation of the ESA; and

WHEREAS, Plaintiffs and Defendants agree that they have reached a settlement that they consider to be a just, fair, adequate, and equitable resolution of the disputes set forth in Plaintiffs' Complaint;

NOW, THEREFORE, IT IS STIPULATED BY AND BETWEEN THE PARTIES AS FOLLOWS:

1. Defendants shall initiate temporary and permanent rulemaking to modify **15A NCAC 10B .0219** to read as set forth in Attachment A to this Agreement.

a. The rulemaking described in ¶1 and Attachment A of this Agreement shall be undertaken pursuant to Chapter 150B of the North Carolina General Statutes, following the below outlined timeline:

Temporary Rule

•Within 21 business days after Court's Order modifying injunction:
NCWRC votes on Notice of Text
•7 business days after vote on Notice of Text:
NCWRC initiates public comment period
•15 business days after initiation of public comment period:
Public comment period closes
•Within 37 business days after vote on Notice of Text:
NCWRC reviews comments and adopts rule
•17 business days after rule adopted:
Approved rule becomes effective

Permanent Rule

•Within 7 business days after Court's Order modifying injunction:
NCWRC submits fiscal note to Office of State Budget and Management ("OSBM")
•Within 21 business days after approval of fiscal note by OSBM:
NCWRC votes on Notice of Text
•Within 30 business days after vote on Notice of Text:
NCWRC initiates public comment period
•60 days after initiation of public comment period:
Public comment period closes
•Within 15 business days from end of comment period:
NCWRC reviews comments and adopts rule
•45 days after NCWRC adopts rule:
Approved rule becomes effective

b. Defendants shall notify Plaintiffs immediately if they become aware of any letters of objection filed pursuant to the North Carolina Administrative Procedure Act, any disapproval bills introduced in the North Carolina General Assembly, or any other developments that may delay or hinder implementation of the temporary or final rules described in ¶1.

2. If the Rule set out in Attachment A is adopted as a temporary and final regulation within the timeline set out in ¶1, or within the soonest feasible time thereafter in the case of a delay unavoidable by Defendants, Plaintiffs shall, within 15 days of the effectiveness of such final regulations, move for voluntary dismissal of their action against Defendants with prejudice. Such dismissal shall not prejudice Plaintiffs' ability to bring suit for any future violations of the ESA by the NCWRC Commissioners or its Executive Director. In the event that Plaintiffs bring suit against Defendants for any future violations of the ESA related to their authorization of coyote hunting in the Red Wolf Recovery Area, this Agreement shall terminate and be null and void.

3. Defendants shall implement as soon as practicable but not later than November 1, 2014, a telephonic and electronic system to facilitate reporting requirements for the shooting of coyotes and the incidental shooting of red wolves or red wolf-coyote hybrids. Such reporting requirements shall include, but not be limited to:

a. Date, time, location (e.g., hunt area), presence of radio collar, and measurements for all coyotes, red wolves, or red wolf-coyote hybrids shot;
b. Coyote gunshot shall be reported to the NCWRC within 24 hours; and
c. Red wolf gunshot shall be reported to the USFWS or NCWRC within 24 hours, consistent with the requirements of 50 C.F.R. § 17.84(c).

4. Defendants shall implement as soon as practicable but not later than November 1, 2014, a "Canid Cooperator Program" (similar to NCWRC's existing "Black Bear Cooperator Program") whereby coyote hunters may voluntarily submit hair samples from gunshot coyotes, red wolves, and red wolf-coyote hybrids for scientific analysis.

5. For a period of five years starting from the date the reporting program provided for in ¶3 is implemented, Defendants shall prepare and provide to Plaintiffs every six (6) months a written report compiling all the data received from the reports submitted by hunters pursuant to the reporting requirements described in ¶3, as well as any data from the "Canid Cooperator Program" defined in ¶4.

6. Defendants shall, on or before November 1, 2014, issue a permit authorizing the USFWS to trap, sterilize, and release coyotes on private land within the Red Wolf Recovery Area. Such trapping, sterilization, and release shall require the written permission of the landowner and may require GPS tracking technology, according to a protocol agreed upon between the USFWS and Defendants. In the event that the NCWRC and USFWS are unable to reach agreement on such a protocol, Defendants shall issue by November 1, 2014, a permit to the USFWS allowing it to trap, sterilize, and release coyotes on any lands for which it obtains the written permission of the owner of the land on which the coyote is trapped. If, after issuing a permit to the USFWS to trap, sterilize, and release coyotes based on landowner permission, Defendants reach agreement with the USFWS on a different protocol for the program, Defendants may substitute a new permit establishing the agreed-upon protocol.

7. Defendants shall initiate permanent rulemaking to list the red wolf (*Canis rufus*) as a threatened species under 15A NCAC 10I .0104 because the wild red wolf population in

North Carolina is treated as a threatened species pursuant to 16 U.S.C. § 1539(j)(C). Such rulemaking shall be completed by August 1, 2015.

8. Defendants shall undertake outreach efforts to educate the public about the status of red wolves, legal fines and penalties for the unauthorized take of red wolves, the similarity in appearance between red wolves and coyotes, and reporting requirements for the take of red wolves under state and federal law. These efforts shall include, but not be limited to:

a. Inclusion of a section on red wolves and coyotes in the annual North Carolina Inland Fishing, Hunting, and Trapping Regulations Digest ("Digest");
b. Insertion of text in the Digest cautioning hunters to ensure they have properly identified their target species;
c. Emails to the NCWRC's email database regarding the similarity of appearance and potential for mistaken identity between coyotes and red wolves;
d. Distribution of printed or electronic materials to hunters that provide information to distinguish between red wolves and coyotes, and inform hunters about the "Canid Cooperator Program," as defined in ¶4 of this Agreement, as well as standardized methods for taking measurements and hair samples of gunshot coyotes, red wolves, and hybrids; and
e. Emails to the NCWRC's email database and publication of articles on the NCWRC website to educate the public about red wolves that have been injured or killed as a result of gunshot and to seek the public's assistance in identifying those responsible for illegal takes.

9. Any notices required or provided for by this Agreement shall be made in writing and sent to the following.

For Plaintiffs:

Sierra B. Weaver
Southern Environmental Law Center
601 West Rosemary Street, Suite 220
Chapel Hill, NC 27516-2356
919-967-1450
sweaver@selcnc.org

For Defendants:

Erica Garner
General Counsel

NC Wildlife Resources Commission
1701 Mail Service Center
Raleigh, NC 27699-1701
919-707-0014
erica.garner@ncwildlife.org

10. Within 15 days of the execution of this Agreement, the parties will file a joint motion to modify the terms of the Preliminary Injunction entered by the Court on May 13, 2014. The parties will request that the injunction be modified to reflect the terms of Attachment A and that the case be stayed with the modified injunction in place until the dismissal by Plaintiffs provided for in ¶2. Throughout the duration of the stay, the parties shall file status reports with the Court every six (6) months.

11. The parties agree that they will bear their own attorney fees and costs associated with work performed up to and including entry and execution of this Agreement. The parties reserve the right to seek attorney fees and costs incurred subsequent to entry of this Agreement.

12. The parties agree to cooperate fully, to execute any and all supplementary documents necessary to effectuate this Agreement, and to take all additional actions that may be necessary to give full force and effect to the terms of this Agreement.

13. The undersigned agree that this Agreement does not constitute an admission of fault, wrongdoing, or liability by any party. Defendants do not waive their claim of sovereign immunity by entering this Agreement.

14. In the event of breach of this Agreement, the parties have an action at law in any court having jurisdiction over the matter, provided that any breach regarding the provisions subject to rulemaking according to ¶1 of this Agreement shall be subject to the continuing jurisdiction of the Court. By entering into this Agreement, Defendants are not waiving any defense to such action. This Agreement is not enforceable by third parties.

15. The parties agree that this Agreement was negotiated in good faith and that this Agreement constitutes a settlement of claims that were denied and disputed by the parties. By entering into this Agreement, the parties do not waive any claim or defense.

16. The parties hereby acknowledge that the individual executing the Agreement on his/her behalf is authorized to execute this Agreement on his/her behalf and to bind the respective entities to the terms contained herein and that he or she has read this Agreement, conferred with his or her attorney, fully understands its contents, consents to the settlement of the claims on the terms set forth herein, and does so in reliance upon his or her own judgment and advice of his or her attorney and not in reliance on any other representations or promises of the parties or their representatives or attorneys. The parties represent that any necessary corporate and governmental approvals necessary for the binding execution of this Settlement Agreement have been obtained. The persons executing this Settlement Agreement warrant and represent that they have full authority to sign this Settlement Agreement on behalf of the party or parties for whom they are acting. This Settlement Agreement shall be binding upon the parties, their successors and assigns.

17. The Defendants do not waive any statutory or regulatory authority or duties granted to them under State law by entering this Agreement.

18. The Agreement and all of its terms shall terminate and be null and void in the event of discontinuation of the Red Wolf Reintroduction Program in the Red Wolf Recovery Area or in the event that the Court denies the parties' joint motion to modify the terms of the Preliminary Injunction entered by the Court on May 13, 2014.

IN WITNESS WHEREOF, this Agreement is executed in counterparts effective on the last date of execution indicated on the subsequent signature pages.

RED WOLF COALITION

By: Cherie Wheeler

Title: Executive Director

Date: 10.15.14

DEFENDERS OF WILDLIFE

By: Michael Senatore

Title: General Counsel

Date: 10/16/14

ANIMAL WELFARE INSTITUTE

By: Cathy Liss

Title: President

Date: 10/15/14

JIM COGDELL, JOHN LITTON CLARK, JOE C. BARKER, III, WES SEEGARS, NAT T. HARRIS, JR., JOSEPH BUDD, DAVID W. HOYLE, JR., WENDELL (DELL) MURPHY, MARK CRAIG, THOMAS A. BERRY, GARRY SPENCE, JOHN T. COLEY, IV, VERNON (RAY) CLIFTON, JR., THOMAS L. FONVILLE, RICHARD EDWARDS, MICHELL HICKS, TIMOTHY L. SPEAR, in their official capacities as Commissioners of the North Carolina Wildlife Resources Commission; GORDON S. MYERS, in his official capacity as Executive Director of the North Carolina Wildlife Resources Commission

By: _____

Title: Executive Director

Date: 15 October 2014

ATTACHMENT A

15A NCAC 10B .0219 is amended as follows:

15A NCAC 10B .0219 COYOTE

(a) This Rule applies to hunting coyotes. In all counties of the State, except those counties specified in Paragraph b, the following apply:

(1) There is no closed season for taking coyotes.

(2) Coyotes may be taken on private lands anytime during the day or night.

(3) Coyotes may be taken on public lands without a permit from the hours of one-half hour before sunrise until one-half hour after sunset, and from one-half hour after sunset to one-half hour before sunrise by permit only.

(b) In the counties of Dare, Hyde, Washington, Tyrrell and Beaufort, the following apply:

(1) Coyote hunting on public lands is prohibited, except that coyotes may be taken on State-owned game lands by the holder of a permit or license for a specific special hunt opportunity for coyotes authorized by G.S. 113-264(d). Any special hunt for coyotes pursuant to G.S. 113-264(d) shall only allow hunting from the hours of one-half hour before sunrise until one-half hour after sunset. Contests or competition coyote hunts on public lands are prohibited. If, within a calendar year, two or more red wolves are shot by one or more hunters with a valid special hunt permit for coyotes on State game lands within the five counties subject to this rule, all special hunt opportunities for coyotes on State game lands within those five counties shall be suspended for one calendar year.

(2) There is no closed season for taking coyotes on private lands. Coyotes may be taken on private lands from the hours of one-half hour before sunrise until one-half hour after sunset only.

(3) Coyotes may be taken on private lands by permit only, and any take shall be reported within 24 hours to the Commission.

(4) Coyote hunting permits are in addition to hunting licenses. Individuals exempted from license requirements under the provisions specified in G.S. 113-276 must still acquire the coyote hunting permits to hunt coyotes in the counties specified in this Paragraph b. Coyote hunting permits are valid for one calendar year and subject to annual renewal. These permits are non-transferable. Permit holders must submit their harvest reports in order to be eligible for permit renewal.

(c) There are no bag limit restrictions on coyotes.

(d) Manner of Take. Hunters may use electronic calls and artificial lights.