Public Safety Committee
11:00 a.m., Tuesday, May 7, 2024
City Hall Council Chambers
1207 Palm Boulevard, Isle of Palms, SC

Public Comment:
Citizens who wish to speak during the meeting must email their first and last name, address and topic to Nicole DeNeane, City Clerk, at nicoled@iop.net no later than 3:00 p.m. the day before the meeting. Citizens may also provide written public comment here: https://www.iop.net/public-comment-form

Agenda

1. **Call to order and acknowledgement that the press and the public have been duly notified of the meeting in accordance with the Freedom of Information Act.**

2. **Citizen's Comments –** All comments have a time limit of three (3) minutes.

3. **Approval of previous meeting's minutes –** April 2, 2024

4. **Old Business**
   Discussion and consideration of changes to the noise ordinance

5. **New Business**
   a. Discussion of coyote management
   b. Presentation of proposal for 48/96-hour shift rotation for Fire Department

6. **Miscellaneous Business –** Next meeting date: 11am, Tuesday, June 4, 2024.

7. **Adjournment**

Public Safety Committee Meeting
11:00am, Tuesday, April 2, 2024
1207 Palm Boulevard, Isle of Palms, SC and
broadcasted live on YouTube: https://www.youtube.com/user/cityofisleofpalms

MINUTES

1. **Call to Order**

Present: Council members Ward, Anderson, Bogosian

Staff Present: Administrator Fragoso, Chief Oliverius, Chief Cornett

2. **Citizen's Comments**

Mel Miles, property owner and owner of Exclusive Property Management, came before the Committee to speak about his concerns with the proposed noise ordinance. He does believe there should be an objective measurement for noise violations, but he also believes noise concerns are not an island-wide concern. He thinks most of the noise. He shared decibel-level data for noises such as pool pumps, HVAC units, and the ocean.

3. **Approval of Previous Meeting Minutes – March 5, 2024**

MOTION: Council Member Anderson made a motion to approve the minutes of the March 5, 2024 meeting. Council Member Ward seconded the motion. The motion passed unanimously.

4. **Old Business**

A. **Discussion and consideration of changes to the noise ordinance**

Administrator Fragoso agreed with Council members Bogosian and Anderson's suggestion that the noise ordinance be more specific about amplified sound and speech. She said, "Making it specific to noise from an amplified source or speech eliminates the confusion that there seems to be about a complaint being generated by a pool pump or a generator. If that is something that we don't want to count towards a potential violation, then that would be the way to do it. Maybe to reinsert that section recommended by the Planning Commission."

Administrator Fragoso reviewed the decibel levels in the proposed ordinance and then shared a slide detailing decibel level suggestions by zoning district and by land use. She also reviewed the current zoning map.

Chief Cornett shared that Wild Dunes' security handles with most of their noise complaints before it becomes a police department issue.

Council Member Bogosian would like the next draft of the ordinance to include the previously removed language about speech and music, expanded definitions, and noise limits by zoning district.

Council Member Ward asked what problem is being solved by the implementation of the ordinance. Chief Cornett said that while they do not have a large number of calls regarding noise complaints, it is helpful to have an objective ordinance to explain to people why they are getting a ticket. He added that most people will comply with requests from the police to stop the noise-related behavior leading to their interference.

Administrator Fragoso added that the ordinance is in response to the community's calls for more enforcement regarding noise. The Police Department asked for something objective to use when handling noise complaints. Administrator Fragoso noted that decibel limits are an agreement with the community about what is considered reasonable and acceptable. This ordinance is "an effort to facilitate enforcement."

Council Member Ward expressed concern again that the ordinance treats short-term rental license holders differently than homeowners/full-time residents.

Administrator Fragoso will also include language in the next draft about Chief Cornett's ability to deny requests for events that are not in the public interest. The next draft will be discussed at the City Council Workshop on April 9.

B. **Discussion of identifying violations that could trigger revocation of short-term rental license**

Administrator Fragoso reviewed the proposed list activities that could lead to strikes/founded complaints against a business license. Chief Cornett noted that some of these violations could be removed from the list since they are addressed in other ordinances.

Council Member Bogosian suggested deferring conversation about these violations until after the noise ordinance is passed.

Council Member Anderson suggested adding some sort of mitigation effort to the business license revocation process so that business license holders have the chance to rectify the situation. Chief Cornett said that the Code Enforcement Officer does work with property owners and managers to correct issues. He added that the property management companies have been very proactive in dealing with complaints.

C. **Discussion of concepts for improving parking, crosswalks, pedestrian infrastructure on Palm Boulevard**

Administrator Fragoso shared the 6 concepts for Palm Boulevard developed by SCDOT. She said next steps include sharing the concepts with City Council, seeking public feedback on the concepts, and then working with SCDOT on engineering, surveying, and securing funding. She would like City Council to narrow down the options before taking the concepts to the public. Implementation of the selected concept will happen over several years and in phases.

D. **Discussion of parking enforcement transition**

Administrator Fragoso shared a monthly report from PCI detailing their efforts in March. She and Chief Cornett meet with them weekly and will continue to do so for the next several months. She said concerns about lack of enforcement on Palm Boulevard have been addressed. She pointed out that 100% enforcement cannot be expected at all times due to the fluidity of beach parking.

The monthly report will be shared with Council in the workshop packet. Year-over-year data will be shared as more information becomes available.

E. **Review of Police & Fire Department's FY25 Budget**

Administrator Fragoso pointed out that most of the monies in the 10-year capital plans for both Police and Fire are related to vehicle or apparatus replacement. Vehicles are now replaced every six years. Chief Cornett said the radio replacement will be necessary to do all at once and the City needs to keep up with the County as they make changes.

Administrator Fragoso said the second draft of the budget assumes leases for the new fire trucks. Chief Cornett will review the vehicle replacement schedule to see if it can be evened out over time so that there is not such a large expense in one year.

5. **New Business -- none**

6. **Miscellaneous Business**

The next meeting of the Public Safety Committee will be Tuesday, May 7, 2024 at 11:00am.

7. **Adjournment**

Council Member Anderson made a motion to adjourn, and Council Member Bogosian seconded the motion. The meeting was adjourned at 12:59pm.

Respectfully submitted,

Nicole DeNeane
City Clerk

City of Isle of Palms, SC
Coyote Management Plan

City of Isle of Palms, SC
Coyote Management Plan

Purpose

The purpose of this plan is to provide a management strategy and guidelines for staff responses to conflicts with coyotes. Public safety is the City's primary concern and coyotes and other wildlife will be managed with human safety as the priority. The plan seeks to achieve a balance between the importance of human safety and the benefits of maintaining natural wildlife populations. While the City employs educational outreach tools as part of the program to manage human/coyote conflicts, the City recognizes there are situations where immediate control may be necessary.

Strategic Plan

1. Create and implement an ongoing education program.
2. Provide information about the rights and responsibilities of private property owners.
3. Track and monitor coyote activity.

4. Implement a program for lethal control, only when it is determined to be necessary for public safety. For example, when the interactions between humans and coyotes change from sightings and encounters to potentially unsafe *incidents or attacks*. (see definitions below)

This plan should not be seen as static in nature and as the situation and circumstances change the plan should likewise be reviewed and the necessary modifications made.

Definitions

The following definitions should be used when obtaining information from the public and assist in standardized documentation of coyote behaviors.

Observation - The act of noticing or taking note of tracks, scat, and/or vocalizations without actually seeing a coyote.

Sighting - A visual observation of one or more coyotes from a distance.

Encounter - An unexpected direct meeting between human and coyote that is without incident.

Incident - A conflict between a person and a coyote where a coyote exhibited behavior creating an unsafe situation. A coyote may show aggression towards a person without any physical contact.

Attack - An aggressive action by a coyote that involves physical contact with a person and/or a person is injured by the actions of a coyote (example injured while trying to escape an incident or attack)

Descriptions of coyote behavior:

Nuisance

Habituated - A coyote that appears to frequently associate with humans or human related food sources, and exhibits little wariness of the presence of people.

Depredating - A coyote that is preying on pets or livestock.

Menacing - A coyote that exhibits aggravated abnormal behavior; however such coyote does not display the characteristics of a “dangerous coyote”. This may include coyote incidents and/or encounters where a coyote or a group of coyotes could potentially endanger public safety.

Dangerous - A coyote that has attacked a person, exhibits aggressive behavior towards a person and/or poses a significant threat to human safety.

General definitions:

Coyote Smart - To exist together at the same time. Coyote Smart is not passive, but active on the person's part, including actions such as removing specific coyote habitats and employing hazing methods. It provides a mechanism by which persons obtain and maintain a level of knowledge and understanding of coyote ecology, behaviors and appropriate responses, so as to be coyote smart.

Feeding of coyotes - For educational purposes the following are definitions of the types and kinds of ways persons typically feed coyotes.

Intentional feeding - A person is actively and intentionally feeding coyotes. This category also includes intentionally providing food for animals that are in the coyote food chain, an example would be a bird or squirrel feeder.

Unintentional feeding - A person is unintentionally providing access to food. Examples are inappropriate composting, fruit from fruit trees left on the ground, pet food/water bowls, barbecue grills, sheds and house doors (garage) left open, etc.

Unsecured trash - Trash accessible to wildlife. Examples would be garbage cans, bags or dumpsters that are uncovered, open, overflowing or where trash is scattered outside the receptacle.

Habitat - Is a place where a coyote lives and grows and includes food, water, and shelter.

Hazing - Is an activity or series of activities that is conducted in an attempt to change the behaviors of habituated coyotes or to instill healthy fear of people back into the local coyote populations. It is not intended to physically damage the coyote, property or persons.

Passive hazing - Occurs without the presence of persons and includes methods used to discourage the presence of coyotes on one's property. This form may include but not be limited to motion activated devices such as sprinklers, spot lights or strobe lights, noisemakers, fence rollers, enclosed dog runs and electric fences.

Active hazing - Involves personal intervention by both physical presence and action. This may include but not be limited to yelling, clapping or waving one's arms to act threatening towards coyotes, as well as the use of devices including noise makers (air horns, whistles, rocks in cans), water from hoses or water guns, or rock/object throwing.

Safety is the first priority and a coyote should never be cornered or should a coyote's young be approached.

Education and Awareness

Public education and awareness is a key element of this plan. The City of Isle of Palms will provide education and information to residents and visitors on how to be coyote smart. The City will obtain educational materials from organizations that are knowledgeable in the areas of coyote ecology and behavior of coyotes and will distribute these materials as needed. It will be the responsibility of the Isle of Palms Police Department and Animal Control to organize and implement the education outreach program.

Examples of educational outreach:

1. Educational brochures will be made available in City's facilities.
2. Information will be distributed to community liaisons in response to reports of human/coyotes conflicts.
3. Coyote information will be available on the City of Isle of Palms website at www.iop.net.
4. Educational programs for HOAs and other groups will be available.
5. Educational wildlife informational signs will be posted in appropriate parks and open spaces.

Reporting and Tracking

It is imperative that the City has an efficient and consistent reporting of human-coyote interactions. A City of Isle of Palms Police Department Incident report will be completed on all reports of coyote incidents, attacks and pet loss/attack (see definitions). Reported coyote encounters will continue to be tracked by the police department on a monthly list including locations and times.

These reports will be forwarded to Animal Control for tracking. Coyote observations and sightings will be reported to Animal Control for follow up and tracking. Tracking will also be maintained on intentional feeding reports, unsecured trash and active den sites.

These reports and tracking will allow Animal Control officers to identify "hot spots" where education, or habitat investigations might be needed. Educational materials will be offered to all persons reporting concerns about coyote encounters, observations, or sightings.

Hazing

A main issue facing jurisdictions is that urban coyotes lose or have lost their fear of humans. Due to the coyote's nature they have easily adapted to urban living and combined with their lack of fear more coyote/human interactions and conflicts have arisen. One solution to this problem is to reinforce the coyote's fear of humans through the utilization of hazing techniques (see definitions). Animal Control will provide educational information to residents on hazing coyotes and suggested techniques.

Lethal Control

The City, at the sole discretion of City Council, may implement a program of lethal control when the interactions between persons and coyotes escalate to the level of incident or attack. The City of Isle of Palms Police Department will investigate to substantiate such reports of incidents/ attacks. Lethal control may be utilized when the City determines that a coyote(s) pose an immediate danger to persons. The City recognizes it may be difficult to identify the specific coyote that has become problematic and will take reasonable measures to direct lethal control measures toward the offending coyote.

If a person is being attacked or there is an imminent threat of attack on a person by a coyote, a police officer may act immediately to ensure public safety and remove the threat.

Simultaneous to implementation of lethal control and upon conclusion of lethal control measures a comprehensive awareness and education program will be undertaken by the City of Isle of Palms Police Department in the affected area.

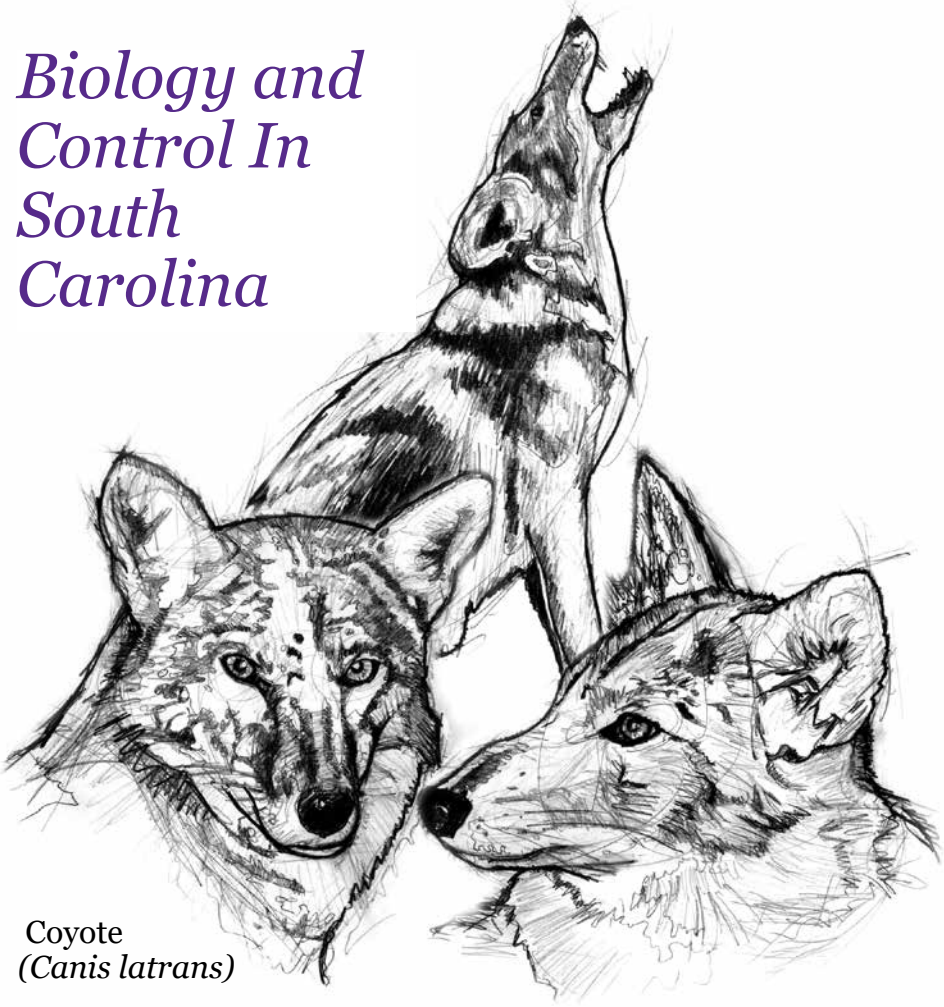
Public Spaces: The City, at sole discretion of City Council, is responsible for the decision as to whether to use lethal control for nuisance wildlife in public spaces with public safety in mind.

Private Property: Property owners within the City of Isle of Palms may employ lawful methods to control nuisance wildlife on their property.

Adopted by City Council on May 22, 2018.

COYOTE

Biology and Control In South Carolina



Coyote
(Canis latrans)

South Carolina Department of Natural Resources
Division of Wildlife and Freshwater Fisheries

Furbearer Project
P.O. Box 167
Columbia, SC 29202

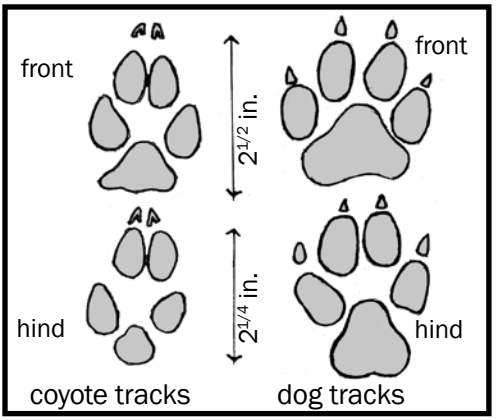
FP Publication 20-02

Contents

BIOLOGY

Appearance

The coyote has the general appearance of a small shepherd-type dog; standing 23 to 26 inches at the shoulder with a slim muzzle, erect pointed ears and a bushy tail. The fur is generally a grizzled, grayish-brown but varies greatly from light tan or reddish-tan to almost black. The typical coyote weighs 30 to 45 lbs., though coyotes more than 60 lbs. have been recorded.



Coyote tracks are similar to other dog tracks; however a coyote's tracks are usually longer than they are wide. Their tracks are usually more compact than dogs', and their stride is longer, about 16 to 18 inches while trotting. Typical coyote tracks are 2 to 3 inches long and 1 1/2 to 2 inches wide with the front heel pad being larger than the rear and with the rear heel pad track usually small and circular in shape. Often, only the middle two claws will be present in the tracks.

Coyote scat varies depending on their diet. Often it is cigar-shaped and may contain bone, hair, berries and seeds. Coyote scat may also be nearly formless and dark red to black in color after feeding on larger animals. The most likely places to find coyote scat is along dirt roads, on ridges, trails, near large rocks or prominent clumps of vegetation. It is believed that coyote scat is often deposited to mark territories.

National Park Service / Jacob W. Frank

Distribution

Though historically found in the western half of the United States, the coyote is now found throughout North America due to range expansion and illegal translocation by houndsmen groups. Populations in South Carolina were established in Pickens and Oconee counties in the late 1970s by both houndsmen and natural immigration. Coyotes have since expanded to include all counties in the State. However, even if no illegal importation had taken place, coyotes would still have become established in South Carolina.

Contrary to popular belief, the South Carolina Department of Natural Resources (SCDNR) did not import coyotes into South Carolina to control the white-tailed deer population, or for any other reason. This rumor also exists in other states as well, but considering the general belief among biologists during that period of time (that coyotes did not impact deer populations), it would have made little sense to import coyotes. In addition, coyotes first appeared in the upstate, where deer reintroductions were still taking place at the time, as opposed to the Lowcountry where deer were plentiful.

Habitat

Though traditionally believed to be adapted to life in open areas, coyotes have expanded into most types of habitats. While they do well in agricultural communities, their relatively high tolerance for human populations allows coyotes to exist in most areas of South Carolina. This includes mountainous regions, swamps, dense forests as well as suburban and even some urban areas.

Feeding Habits

Coyotes are opportunistic feeders. While rabbits probably comprise the majority of their food/prey items, they also eat rodents and other small mammals, and supplement their diet with fruits, berries, and insects when available. They will eat carrion and will also prey upon deer fawns, and occasionally on adult deer especially those with underlying health issues. Deer predation was not originally believed to be a significant factor for deer populations in South Carolina. However, studies at the Savannah River Site, located in Aiken and Barnwell Counties, have shown that coyote predation on fawns can impact recruitment, and fawns can be particularly vulnerable to predation for the first 6 to 8 weeks after birth. When coupled with human harvest of deer by hunting, coyote predation on fawns appear to be an additive source of mortality. While this study's findings may not be uniform across the entire state, it points to evidence that coyote predation can impact deer fawn survival, and thus deer populations, at least in localized areas.

Coyotes can also prey on domestic poultry and livestock, particularly sheep, goats and calves. Calf predation usually subsides after weaning. Cows giving birth, especially animals having difficult births, can be susceptible to predation as they usually separate from the herd while birthing. On occasion, coyotes will prey on domestic pets, especially cats. Pet predation is usually due to the territorial nature of the coyote and lack of an alternative prey base in suburban areas.

Behavior

Coyotes are typically most active beginning at twilight and continuing throughout the night. In some areas they may be seen during the day, especially when left undisturbed. Coyotes have a keen sense of smell and good eyesight. They can reach speeds of 40 mph for short durations, though they can sustain relatively high rates of travel over several miles.

Resident, or territorial coyotes, typically have a home range from 2 to 20 square miles, with resident females occupying smaller ranges than males. Transient or solitary animals usually have much larger home ranges than resident

animals, again with the males being larger than the females. Coyotes may move several miles within their home range daily, and their movement activity usually peaks during the late winter breeding season. Resident animals will defend their territory against transient coyotes.

Coyotes usually hunt alone or in pairs and may travel over fairly large areas in search of food. Transient coyotes do not form packs, but residents form pack-like groups that may be seen occasionally. These packs are typically (but not always) related family members and may consist of a mated pair, non-breeding offspring from the previous year, and the current year's pups.

Coyotes have various calls, in addition to howling, that include yips and barks. Typically, their vocalizations are used to communicate location or to gather individuals together. Coyote vocalizations usually peak during the breeding season, and vocalizations are generally more frequent during clear nights with moderate temperatures. Often, loud noises from trains, airplanes or sirens will trigger coyote vocalizations.

Breeding

Coyotes are generally monogamous, with breeding among the dominant resident pair beginning in January and continuing into March. Subordinate animals in a group with a dominant breeding pair typically do not breed.

The gestation period is 63 days, and the average litter size is 5 to 7. Pups begin to leave the den at 3 to 4 weeks, are weaned at 8 to 9 weeks, and the family breaks up permanently at 9 to 10 months as juveniles disperse. In areas where food is abundant, female young of the year may breed the following winter. Both adults, and on occasion other adults linked with the breeding pair, will hunt and bring food to their young. While raising young, coyotes will den in brush piles, banks, gullies, and old abandoned barns. Sometimes coyotes will den in burrows of other animals after enlarging their holes. Coyotes generally do not use dens except when rearing young, preferring to bed in tall grass and brush at other times of the year.

Coyotes are capable of interbreeding with domestic dogs, but survival of the offspring is low. Typically, coydogs' breeding cycles do not correspond to coyotes', thus further breeding with coyotes is unlikely even though coydogs may be able to reproduce.

Controlling Factors

Coyotes are subject to canine distemper, parvo, hepatitis, mange, and rabies. Coyotes also harbor a variety of parasites such as fleas, ticks, worms, and flukes. The incidence of rabies in South Carolina coyotes is unknown, as few animals are submitted for testing. There is no routine rabies testing surveillance in the state, as animals are only tested when a potential exposure occurs.

Incidental take from hunting activities, most notably deer hunting, comprises most of the yearly coyote harvest in South Carolina. Based on deer hunter surveys, hunters kill approximately 25,000 coyotes annually.

Although western pelts may bring relatively high values from time to time, a strong market has not developed for the eastern coyote. However, it is legal for a licensed trapper to sell live coyotes to fox and coyote running enclosures during the open trapping season.* Therefore, there is an incentive for sport trappers to target coyotes. Some landowners have been able to coordinate with the South Carolina Trappers Association to locate a local trapper that might be willing to trap on their property during the open trapping season. However, as nuisance coyote problems increase and become more widespread, the demand for contract coyote control work should increase and the number of coyotes taken from trapping by Wildlife Control Operators (WCOs) will rise.

*Check current SCDNR Trapping and Commercial Fur Harvest laws and regulations.

Status

Coyotes are considered furbearing animals in South Carolina; however, coyotes may be hunted throughout the year with a valid hunting license on private lands. The use of electronic calls is legal statewide, and coyotes can be hunted at night on registered properties. Go to the SCDNR website's Night Hunting page at dnr.sc.gov/nighthunt to register a property to hunt coyotes at night. Laws and regulations may change, so check the current SCDNR Hunting Rules and Regulations before hunting coyotes in your area.

Individuals may trap coyotes during the trapping season (December 1 through March 1) with a valid Commercial Fur Harvest license in addition to the required hunting license. Check the current SCDNR Trapping and Commercial Fur Harvest brochure for more information about trapping regulations.

Depredation permits are available for controlling destructive coyotes year-round. No hunting or trapping license is required with a depredation permit. For more information about depredation permits, see the **Depredation Permits** section in the back of this publication or contact the SCDNR Permitting Office at (803) 734-3887.

Coyotes and their associated damage are unpopular with livestock producers and sportsmen. Nevertheless, attempts in other states to eliminate or drastically reduce the coyote population on a large scale have proven unsuccessful. Various coyote incentive programs have been tried over the years throughout the United States, with the stated goal being to reduce or eliminate coyotes; however, there has been very little to show for these efforts in terms of positive results. In fact, even under the presence of paid bounties, the coyote spread from its historical range in the west to occupy the entire continental U.S.

Bounties for coyotes, while usually very popular, generally do not produce any appreciable effects, or at best are only temporary, leading most states to abandon paying coyote bounties. Since nearly 30,000 coyotes are taken annually in South Carolina by hunters and trappers, a bounty would likely only pay for a portion of the coyotes currently being harvested at no cost. Nevertheless, for a bounty system to be successful, a significant number of *additional animals over the current harvest levels* must be removed on an annual basis. Given current liberal hunting and trapping regulations, the number of coyotes being removed under these regulations, and the notion that people who want to control coyotes

are already attempting to do so, it is highly unlikely that a paid bounty would add appreciably to the number of coyotes in the annual harvest. Lastly, as with any monetary incentive, there is no guarantee that coyotes submitted would actually originate from South Carolina, as historically many bounty programs have been plagued with fraudulent bounty submissions.

When necessary, it is possible to control coyote-related damage at the local level by targeting and removing the specific offending animals. If coyotes in the area are not causing specific depredation problems, it is suggested they not be removed merely because of their presence. Coyotes are territorial, and the removal of non-depredating coyotes may result in replacement with coyotes that are more prone to cause problems.

Attempting to control overall coyote numbers can be frustrating as new immigrant animals often quickly fill the voids left from the removal of resident animals. In addition, reproduction may actually increase from the removal of these resident coyotes with animals beginning to breed at younger ages, although reproduction still only occurs once annually and the overall fecundity of coyote populations with younger coyotes tends to be lower.

Damage Identification

In case of suspected coyote depredation, the area should be searched for tracks, droppings or any other sign that might indicate a coyote's presence. However, coyotes will scavenge dead animal carcasses; therefore, the presence of a dead animal with coyote sign in the vicinity does not necessarily indicate coyote depredation. Accurately determining coyote depredation involves carefully examining the carcass. Hemorrhaging just under the skin at the bite marks indicates the animal was alive when bitten; however, tooth marks under the skin without accompanying hemorrhage indicate the animal was fed upon while dead. The surrounding area should also be investigated for signs of a struggle. Attacks on larger animals usually involve a longer duration of attack, and the adjacent area may have broken vegetation, drag marks or scuffs, as well as blood and/or hair at the site of the kill.

Typical coyote predation involves attacking the throat of the prey, though some attacks on calves may be to the flanks or hindquarters. The presence or absence of this predation pattern, however, does not necessarily indicate coyote predation. Domestic dogs, which typically attack the flanks, hindquarters and heads of animals, will exhibit coyote predation patterns, while some coyotes may resemble that of domestic dogs. Often, domestic dogs will not feed on the killed animal, though true feral dogs and coydogs may kill for food and be efficient predators. Only a thorough investigation of the kill and surrounding area may help determine the actual predator involved.

Determination of predation can be a difficult task. The amount of evidence at the site of the kill along with the amount of prey and the age of the carcass are factors in assessing the source of predation. Usually, accurate determination of predation involves experience and a keen knowledge of the species of predators in the area. Even this acquired skill may not confirm the cause of death in many cases.

Non-lethal Control

Exclusion

Fencing, where practical, can deter livestock predation. Traditional barbed wire fences are not a deterrent to coyotes. However, certain woven wire fences can keep out coyotes if installed properly. Because coyotes can dig under most woven-type fences, it is recommended that an apron of fence be buried perpendicular to the fence for a width of two feet around the outside of the fence. Because of the expense, this type of fencing may only be feasible for pens and corrals. If a buried apron fence is too expensive or impractical, electrified wire near ground level may deter coyotes from digging under the fence. An electric wire at the top or a barbed wire overhang angled towards the outside of the fence may deter climbing over the fence.

Another way to deter coyotes climbing over a fence is to install a length of PVC pipe using a larger diameter pipe over a smaller diameter pipe or conduit, or with a wooden end piece mounted inside the pipe that can be mounted on top of a fence to allow the outer pipe to spin (Figure 1.). As the animal reaches the top of the fence, the outer pipe rolls and prevents climbing over the top of the fence. This can also serve to keep pets inside the fence. Rollers are likely better suited to smaller yards or enclosures.

Electric fences can also deter coyotes if the spacing between the wires is 8 inches or less at the top and at least four strands at the bottom spaced 4 inches or less. These fences should be at least 5 to 6 feet high. The addition of an outside wire 8 to 10 inches out from the bottom of the fence and 6 to 8 inches high may greatly improve the effectiveness of an electrical fence.

Existing fences can be modified to deter coyotes by attaching 3 to 4 strands of electric fencing 8 to 10 inches to the outside of an existing fence.

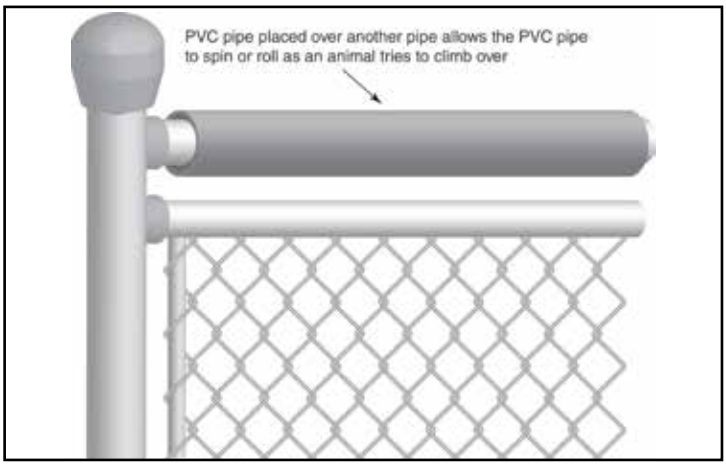


Figure 1. Fence rollers at top of fence to prevent climbing

It is important that all fencing be adequately maintained and in working order to ensure its effectiveness.

Cultural Methods - Livestock & Rural Areas

Some cultural methods can help minimize livestock loss to coyotes and other predators. Because of the high nutritional demands of bearing and raising pups, coyote predation may be highest from late spring to early fall. Changing calving or lambing season outside of this time frame, or shortening or synchronizing the birthing seasons may result in some reduction in livestock predation. Confinement of smaller herds of livestock at night can also reduce coyote predation, especially in lighted predator-resistant fences.

Some modifications to the surrounding habitat may also be beneficial to reducing coyote depredation. Coyotes often use cover to stalk their prey, and reducing the amount of cover near pastures may lessen predation. Furthermore, brush piles and heavy grass cover increase habitat for rabbits and other small prey, thus attracting coyotes to the area. Cleanup or removal of this type of cover in some areas may also promote a reduction in predation.

The dumping of livestock remains can attract coyotes and increase the chances of livestock predation as coyotes could become accustomed to feeding on livestock. Proper disposal of livestock remains may reduce coyote predation.

Cultural Methods - Suburban Areas

Coyotes that consume a significant proportion of human-related food items are more likely to become habituated toward people and cause negative interactions. These food items include pet food, garbage, and discarded food scraps. Neighborhoods should encourage feeding pets indoors as well as proper disposal of all trash. Food items used for composting should be placed in sealed or closed bins.

Coyotes are most active beginning near dusk and continuing into the early morning hours after dawn, so it is advisable to keep smaller pets inside at night if possible. Cats should also remain indoors not only for their safety, but to reduce the negative impacts cats can have on native wildlife. All pets should be fed during the day, and any food and food containers should be removed before dark. A coyote's sense of smell is excellent, and they can be attracted to the smell of pet food or even residual smells left by an empty bowl. People should walk their pets in more open areas that prevent a coyote from ambushing the pet. All pets being walked should be kept on a short leash. If a coyote is seen, act aggressively towards the animal, but do not run.

Feral cat colonies can be problematic on many levels. However, the deliberate feeding of a feral cat colony can attract coyotes, as well as other wildlife, to the colony. This concentration of cats represents relatively easy prey to a coyote. Discourage the feeding of any stray cats or, at a minimum, require any remaining food to be collected before dark.

Suburban and urban coyotes tend to utilize parks and natural areas more than places with less green space. Developed communities with significant amounts of green space can modify the habitat to make the area less attractive for coyotes. Undeveloped lots and common areas should be managed to keep underbrush and overgrown areas to a minimum. Not only do these areas provide travel corridors, but also provide denning, hiding and ambush sites for coyotes. In addition, brushy and overgrown areas provide habitat for small mammals which are a primary food source for coyotes. Opening up overgrown areas can help discourage coyotes from remaining in these places, especially during daylight hours.

Parks and recreational areas should prohibit the feeding of wildlife. Visitors to these areas must not be allowed to feed wildlife, and the proper disposal of all refuse must be enforced. Leash laws should also be enforced to help prevent pet attacks or any other coyote and dog confrontations.

Coyotes should never be allowed to become habituated to people. When coyotes are sighted, especially in daylight hours, every effort should be made to harass and run the animal off. It is necessary to keep coyotes fearful of people to prevent negative coyote behavior.

If coyote sightings become more frequent and confrontations with people and pets begin to occur, such as chasing joggers, bicyclists, or people walking pets, it is a sign that coyotes are beginning to lose their fear of humans. When this occurs, the potential for some type of negative coyote encounter increases. Coyotes that exhibit aggressive behavior should be removed by a professional trapper. The SCDNR maintains an online list of Wildlife Control Operators that perform wildlife removal services, usually for a fee. See the **Wildlife Control Operators** Section on page 23.

Guard Animals

Certain animals such as donkeys, mules, llamas, emus, ostriches, and certain breeds of dogs have some promise in reducing coyote predation for livestock producers. Research has shown guard dogs to be particularly effective at reducing livestock damage, especially when the dogs are reared with the livestock from a very early age. Great Pyrenees dogs are probably the most commonly used livestock protection breed in South Carolina. Donkeys and mules may also have value as guard animals for sheep and goats.

For more information about guard animals, contact the United States Department of Agriculture's Wildlife Services office listed in the back of this booklet.

Great Pyrenees dog with goats at a farm in Princeton, SC.

Frightening Devices

The use of frightening devices may temporarily reduce coyote predation. Lights over corrals have been shown to be effective. Parked cars, strobe lights, and noise-making devices may have some value in deterring coyotes for very short periods of time. Varying locations and/or intensity is important as coyotes can quickly become habituated to such techniques. The effectiveness of frightening techniques may be very limited.

Lethal Control

Toxicants

No toxicants are registered for use on coyotes in South Carolina. The use of any poison to control predators in South Carolina is a violation of State and Federal law. Nevertheless, coyotes can become accustomed to avoid poisoned baits and the use of illegal poisoning is more likely to affect nontarget wildlife and pets.

Shooting

Shooting coyotes to control predation can be effective in certain situations, and may be the only viable alternative for individuals inexperienced or uncomfortable with trapping.

Coyotes have a keen sense of smell; therefore, shooting locations should be selected so as to remain downwind from the area where coyotes are likely to approach. Smaller caliber centerfire rifles, where safe and legal to use, are capable of killing coyotes at relatively long ranges. A shotgun may be desirable when attempting to shoot coyotes at close range or in heavier cover types. Usually the smaller sizes of buckshot, such as #4, are preferred over the larger sizes.

Coyotes can be attracted through the use of predator calls, though the exclusive use of calling to control coyote depredation may not be successful, as they may become wary of repeated attempts to call and shoot. Usually the first few hours after sunrise and before sunset are the most effective times to call in coyotes. Even the imitated sound of a howl may attract a coyote, though the animal may approach without responding. Electronic calls with a wireless remote control may be more effective as the calls originate away from the hunter's location. Remote motion decoys may also increase the effectiveness of using predator calls. Night hunting is allowed on registered properties with the owner's permission. See dnr.sc.gov/nighthunt to register a property for night hunting.*

Locating den sites may aid in removing coyotes, especially during the pup-rearing season, as the pups may trample vegetation just outside of the dens when beginning to venture out. This may make locating den sites easier.

In certain areas, the use of dogs to pursue coyotes and bring them into the range of shooters may be somewhat effective.

*Check the current SCDNR Rules and Regulations brochure in regards to hunting or shooting coyotes as well as the current night hunting regulations.

Trapping

Trapping is probably the most effective tool for removing problem coyotes. However, the coyote's wary nature and keen sense of smell can also make them one of the more difficult furbearing animals to trap. Inexperienced trappers or poor trapping techniques may help educate coyotes to avoid traps and become "trap shy."

The normal trapping season is December 1 to March 1. A Commercial Furharvest License, commonly called a trapping license, is required along with a hunting license to trap during the season. However, property owners experiencing coyote-related damage may trap or shoot (in areas where firearms may be lawfully discharged) coyotes within 100 yards of their residence (so long as they are still on their own property or an adjacent property with landowner permission) without any kind of license or permit. Outside of this 100 yard residential area, a permit or trapping license (during the trapping season) would be required (see **Depredation Permit** section on page 22).

It is suggested to wear rubber boots and clean gloves while preparing the trap site to minimize human odor to the best extent possible. Remove gloves when applying any scent or lure so as not to get any on the traps or equipment, which might prompt a coyote to dig up the trap.

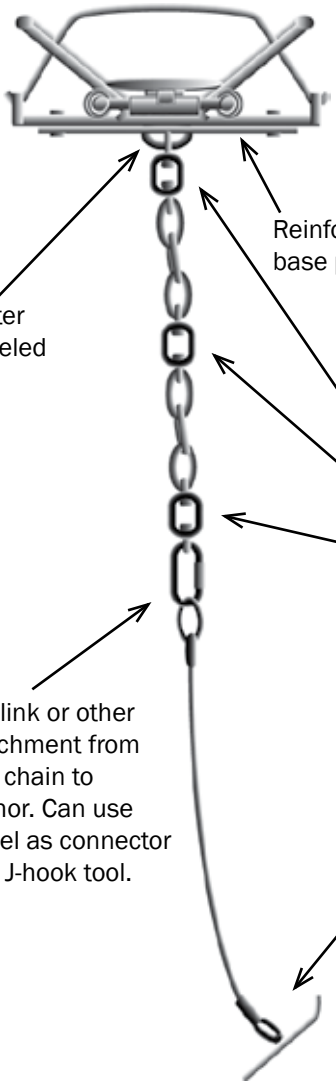
Selecting a proper trap site is key to determining whether or not trapping will be successful in controlling problem coyotes. It's important that traps are placed in areas where coyotes are traveling or frequenting. Preferably, place traps where scent will travel in the direction coyotes are likely to approach. Dirt road, trail, dam, stream, and fence crossings as well as field corners and borders, hedgerows, brush piles, isolated hay bales, or other prominent property features are all good areas to look for coyote sign, such as tracks or droppings. Coyotes, just like domestic dogs, will urinate on objects that stand out, such as fence posts, large rocks and other distinctive land features. Trappers can use this behavior to their advantage by trapping at these "scent posts."

Traps may also be successful if placed on trails near areas where livestock have been killed. Keep traps at least 50 feet away from dead animals or animal parts to avoid catching vultures or other nontarget animals.

Only foothold traps, with an inside jaw spread of 5 ¾ inches and smaller are legal for use on coyotes in South Carolina. Live traps are legal for use, though generally not very effective for coyotes. However, certain suburban and urban settings may require their use. Because a trap is defined in South Carolina as "any device, other than a weapon, designed or constructed for taking animals," the use of other devices designed or improvised for catching coyotes may be illegal.

Check the current SCDNR Commercial Fur Harvest brochure for more information about legal traps and trapping, or contact the Furbearer Project at 803-734-3609 or via email at Furbearerprogram@dnr.sc.gov.

Coyote Foothold Trap System



Examples of approved BMP foothold traps*:

- Standard Jaw -
MB - 550 RC
Bridger #1.65 OS laminated 4 coil
Bridger #2 OS laminated
Victor #1.75 OS laminated
Montana Special #3 laminated
Sleepy Creek 1¾ OS wide jaw
Victor #1.75 or #2
KB Compound 5.5 laminated

- Rubber Padded -
Victor #3 Soft Catch, 4 coil
Victor #1½ Soft Catch, 4 coil
Victor #1¾ Soft Catch
MB - 550 RC RJ - rubber jaw
Duke #3 rubber jaw
Bridger #3 rubber jaw
Jake Trap

*BMP traps listed may not be a comprehensive list of all current BMP-approved coyote traps.
All product names or brands are property of their respective manufacturers or distributors.
Brand names used in this publication are for identification purposes only.
Use of any of these traps or devices does not imply endorsement by SCDNR.

Equipment *(a complete checklist is found on page 24 of this booklet)*

For trap sets using foothold traps:

- ☐ It is recommended that all trappers use Best Management Practices (BMP) approved traps. BMP traps have been scientifically shown to be humane and efficient at capturing coyotes (see Coyote Foothold Trap System on page 12 for a trap setup example). Contact the Furbearer Project listed at the back of this document for more information on BMP traps.
- ☐ Foothold traps with an inside jaw spread of 5 ¾ inches or less, at least one per trap site, with at least two swivels: one at the bottom of the base plate and one at the end of the chain (Fig. 2 on page 14). Traps with reinforced base plates are highly recommended.
- ☐ A single earth anchor type staking system with either 12 to 18 inch cable or chain attachment to the earth anchor, or 18 to 24 inch steel rebar trap stakes, using two per trap, crisscrossed with a double stake swivel.
- ☐ Pan covers, if desired (crumpled up and unfolded wax paper makes a suitable pan cover as does brown coffee filters and fiberglass screen material cut to shape) or polyester fiber fill used under the trap pan.
- ☐ Trapping sifter for sifting dirt over trap (a small wooden frame or a cake pan with the bottom cut out and covered with ¼ inch hardware cloth will suffice).
- ☐ Clean gloves.
- ☐ Garden trowel or trapper's shovel for digging holes.
- ☐ Hatchet or pick for cutting roots and driving stakes.
- ☐ Coyote urine, food baits or other lure (keep urines, baits, and lures separate to prevent scent from getting on traps and equipment).
- ☐ Plastic bucket or trapping bag to carry supplies.
- ☐ 3'x 5' piece of canvas or cloth for kneeling on while setting traps, a kneeling pad or knee pads are helpful as well.
- ☐ Dry soil for setting traps in wet or rainy weather, if necessary. Dry soil may be mixed with peat moss, salt or commercially available trapping antifreeze (calcium chloride) for use in freezing temperatures (note: salt will promote trap rusting and traps used in salt-mixed soil must be thoroughly cleaned after use). Wax flakes melted into fine dry soil (not sand) will also provide protection for trap sites during rainy days as well as protection from freezing. Wax flakes and waxed dirt may be available from some trap supply companies.

Trap Preparation

All traps should be checked to ensure they function properly. The trap pan should sit level with the jaws when set. It may be necessary to bend the portion of the frame that holds the small device called the dog to adjust pan height. Bending the frame out raises the pan and bending it in lowers the pan. Certain traps may adjust differently, so you may need to consult the manufacturer of the trap in some cases. Also, the dog should engage the notch cut in the pan so that only slight downward movement of the trap pan causes the trap to close. Too much

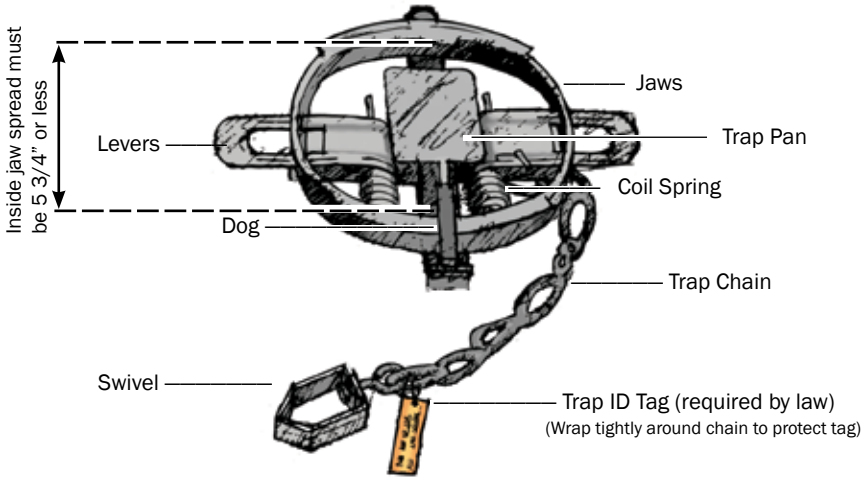


Figure 2. Parts of the coilspring foothold trap

pan travel may cause the animal to withdraw its foot from the trap. Therefore, it may also be necessary to file the notch and dog square to ensure proper engagement so that the trap fires quickly. Pan tension, or the amount of weight required to fire the trap, should be set at 2 to 4 lbs. to reduce nontarget catches. Pan tension is usually adjusted by a small nut and bolt located at the base of the trap pan. A plastic bottle, filled with enough water so that it weighs 2 to 4 lbs., can be used to adjust pan tension. Test pan tension with the loose side jaw up.

Properly maintained traps function better and last longer. New traps come with a thin coat of oil that must be removed, and it is advisable to dye and wax traps before use. This helps to camouflage the trap and to prevent rusting. Boil new traps in water and baking soda, or take the new traps to a commercial car wash and use the tire or engine cleaning setting to remove any oil or grease. Thoroughly rinse all traps and place outside to dry and promote rusting. Dipping the traps into a solution of saltwater will hasten rust formation. While it seems contradictory to allow new traps to rust, some light rust is required for new traps to accept dyeing.

After a *light coat* of rust has formed, boil the traps in a commercially available trap dye solution, or use a sufficient quantity of red oak or maple bark, walnut or pecan hulls, or sumac berries. Boil the traps for 1 to 2 hours. Trap dye can stain anything it comes into contact with, including concrete, wood, hands or clothes. It is best to apply dye outdoors, wearing gloves and old clothing. Remove the traps from the dye solution and allow to dry where they will not come in contact with foreign odors. A board with several nails spaced along its length makes a very suitable place to hang traps to dry.

As an alternative to boiling traps, commercial dips are also available. These dips often use either water or a solvent (mineral spirits, gasoline, white gas) and are cold dipped. Solvent dipped traps do require much longer to “air out”

until the smell of the solvent dissipates. The airing out time can be as long as two months depending on the solvent used and the environmental conditions where the dipped traps are being stored.

Waxing traps serves two important functions. A thin coat of wax serves to prohibit further rusting and lubricates the trap allowing it to work smoothly. Waxed traps may present some problems with melting in extremely hot weather, and it may be preferable not to use waxed traps during these times. In this case, a few drops of vegetable oil can be used to lubricate moving trap parts if necessary. Paraffin, usually available at grocery and craft stores, makes a suitable trap wax, though some waxes available at trapping supply companies often have additives that provide a more durable wax coating.

Waxing traps can be dangerous! Wax is highly flammable, and this procedure should always be performed outside and away from combustible materials. Avoid heating wax over open flames as dripping wax can ignite. Always keep a nonflammable cover on hand to place over the wax container should it ignite. Melt the wax slowly, and use enough to completely cover the trap. Slowly dip each trap by its chain into the melted wax with a piece of wire, and leave it in long enough for the trap to heat to the temperature of the wax. When removing a trap from the wax, hold it over the container for a few seconds to allow excess wax to drip back into the container. Hang the trap to dry, and repeat the process for each trap. Again, a board with several nails spaced along its length makes a very suitable place to hang traps to dry.

Before newly waxed traps are used, be sure to remove the wax from the trigger area where the notch in the trap pan makes contact with the small device called the dog, which holds the trap in the set position. Failure to clean wax from the trigger area may cause difficulty in setting the trap.

An alternative to dyeing and waxing traps is to paint the traps with a flat black or brown rust-inhibiting spray paint after degreasing and allowing the light coat of rust to form. Thinned paint can also be used as a dip for coating traps, and the slight rust coating is optional using paint as a dip. Use an oil-based paint in flat black or brown, thin at a 1 to 1 ratio with acetone using a 5-gallon bucket. In a well-ventilated area, or using an approved respirator mask, dip the traps into the paint bucket using a stiff wire with a hook at the end. Let set a minute and allow to drip back into the bucket until most dripping stops. Hang on nail board to dry. Pick a day with relatively high temperatures and low humidity when dipping traps in paint, otherwise the traps will stay tacky and take much longer to dry, increasing the chance to damage the paint finish.

To ensure proper functioning, it may be necessary to lubricate moving parts with a small amount of vegetable oil.

Periodically, traps become soiled and need be cleaned. At least once a year, clean traps to maintain good working order. Heavily soiled traps can be pressure washed at home or at a local car wash rather quickly before repeating the dyeing and waxing process if needed. Store traps out of the weather and in containers or locations where strong odors are not present.

Coyote Trap Sets

Dirt-Hole Set

This set uses a dug hole along with a food bait or food lure to help attract the attention of coyotes. Only one trap is set per site. Locate a suitable area where a coyote is likely to travel as suggested in the Trapping section. It is recommended that the trap site be located where one is able to dig a hole with relative ease. Rocky ground and low wet areas that cause the hole to fill with water should be avoided when choosing this set. Wear gloves except when placing bait to avoid contaminating the gloves with scent.

Step 1. Select a site where a coyote is likely to travel. This set must be closer to the coyote's path than the scent post set. Preferably there should be some kind of prominent backing (tuft of grass, embankment, rock, fence, etc.) behind the trap site that prevents the animal from approaching the trap from behind, if not it can be added when the trap set is completed.

Figure 3. Digging the dirt hole.

Step 2. Place the cloth on the ground to kneel on while preparing the trap site. Wearing clean, odor-free gloves, dig a hole about 8 to 10" deep at an angle under the backing. The hole should be about 3 to 5" round. Place the dirt from the hole into the sifter for later use (Fig 3).

Step 3. Dig a bowl-shaped depression for the trap to rest in approximately 8 to 10" from the dirt hole. This trap bed should be made so the trap will sit just below flush with the ground when covered with a thin layer of dirt (Fig. 4). Place the dirt from the depression on the kneeling cloth and some into the sifter for later use. Leave some loose soil in the bottom of the trap bed. In wet or damp areas, dry soil must be brought for finishing the trap set since damp soil will not sift properly.

Figure 4. Digging bowl shaped trap bed in front of the dirt hole.

Step 4. Drive the earth anchor into the bottom of the trap bed until fully seated up to the trap chain attachment point. If using rebar for a trap anchor, drive two stakes crisscrossed at the end of the trap chain in the center of the hole to secure the trap (Fig. 5).

Figure 5. Driving earth anchor in trap bed.

Step 5. Set the trap, being sure that the pan sits level with the jaws of the trap. Place trap in trap bed, and press it into the loose soil. It is imperative that the trap does not rock or move when pressure is applied to the trap jaws. Any trap movement may cause the coyote to shy away from the trap site or dig up the trap. Take loose soil to pack under and outside the trap jaws to ensure that the trap is firmly bedded in the soil. Some trappers will begin bedding with the loose jaw of the trap up to prevent getting caught if the trap is accidentally set off while bedding trap (Fig. 6). Make sure that the soil outside of the trap jaws is firmly packed as well since loose dirt around the trap may prompt the coyote to dig up the trap. If desired, a cover can be placed over the trap pan at this time to prevent dirt from getting under the pan. Polyester fiber fill can also be used under the pan for the same purpose. If no cover or fiber fill is used, be sure not to place too much soil under the pan to prevent the trap from being sprung. Flipping up the loose jaw will make placing poly-fil under the trap pan easier (Fig. 7). Lay loose jaw back down again (if turned up) and confirm trap is solidly bedded.

Step 6. Carefully sift dirt over the trap, completely covering the set trap (Fig 8.) Using a trowel, a stick, whisk broom or the side of your hand, carefully smooth the covered trap to ensure the trap pan is set slightly below the level of the surrounding ground, exposing the trap if necessary (Fig. 9).

Step 7. Finish covering trap with a layer of dirt, and smooth over again if trap was exposed in the previous step (Fig. 10). Pick up the kneeling cloth and discard any unused soil away from the trap site.

Figure 6. Bedding trap (with loose jaw up).

Figure 7. Poly-fil added under trap pan.

Figure 8. Sifting dirt over trap.

Figure 9. Location of trap.

Step 8. Use dry dirt (Fig. 11), dead grass or other light duff material to make the set appear natural, although the appearance of freshly dug dirt can be an attractant as well (Fig. 12). As most animals will avoid stepping on objects, sticks or small rocks may be used to help guide the animal's foot into the trap. Do not use anything that may interfere with the trap mechanism when completed (Fig. 13). Some kind of backing such as a rock, piece of wood, clump of grass, etc., may be needed to prevent coyotes from approaching the dirt hole from the back side.

Step 9. Take off gloves. Place a small amount of bait or food lure into the hole. It may help to wad a ball of dead grass or sheep's wool and place over the bait inside the hole. The addition of a second type of food bait or lure on top of the ball of grass or wool may be more attractive to coyotes. Make sure the entire trap set appears natural before leaving. Lure or urine can be applied to any backing on the set.

Scent Post Set

This is a general set using coyote (or fox) urine that can be used in nearly any area for trapping coyotes. A scent post is merely an object that would be appealing to coyotes to mark with their urine. It is important to locate a suitable trap site as suggested in the Trapping section. The scent post set can be chosen with the scent post object already in place, or you can place the scent post object after the trap has been set and bedded. This allows a lot of flexibility in selecting a trap site location.

Figure 10. Covered trap.

Figure 11. Aging trap with dry dirt.

Figure 12. Dead grass sifted over trap bed for a more natural look.

Figure 13. Completed Dirt Hole Set.

Step 1. Select a site where a coyote is likely to travel and upwind from their predicted path of approach. Wearing clean, odor-free gloves, place the kneeling cloth down. Dig a bowl-shaped depression for the trap to rest in. This trap bed should be made so the trap will sit just below flush with the ground when covered with a thin layer of dirt. Place the dirt from the depression on the kneeling cloth and some into the sifter for later use. Leave some loose soil in the bottom of the trap bed. In wet or damp areas, dry soil must be brought for finishing the trap set since damp soil will not sift properly.

Step 2. Drive the earth anchor into the bottom of the trap bed until fully seated up to the trap chain attachment point. If using rebar, drive two stakes crisscrossed at the end of the trap chain in the center of the hole to secure the trap.

Step 3. Set the trap, being sure that the pan sits level with the jaws of the trap. Place trap in trap bed, and press it into the loose soil. It is imperative that the trap does not rock or move when pressure is applied to the trap jaws. Any trap movement may cause the coyote to shy away from the trap site or dig up the trap. Take loose soil to pack under and outside the trap jaws to ensure that the trap is firmly bedded in the soil. Some trappers will begin bedding with the loose jaw of the trap up to prevent getting caught if the trap is accidentally set off while bedding trap. Make sure that the soil outside of the trap jaws is firmly packed as well, since loose dirt around the trap may prompt the coyote to dig up the trap. If desired, a cover can be placed over the trap pan at this time to prevent dirt from getting under the pan. Polyester fiber fill can also be used under the pan for the same purpose. If no cover or fiber fill is used, be sure not to place too much soil under the pan to prevent the trap from being sprung. Flipping up the loose jaw will make placing poly-fil under the trap pan easier. Lay loose jaw back down again (if turned up) and confirm trap is solidly bedded (Fig. 14).

Step 4. Carefully begin to sift dirt over the trap, completely covering the set trap. Using a trowel, a stick, whisk broom or the side of your hand, carefully smooth the covered trap to ensure the trap pan is set slightly below the level of the surrounding ground. Pack the soil around the trap to approximately the same firmness as the surrounding ground.

Figure 14. Fully bedded trap shown. Note that there is no scent post yet at this trap site.

Step 5. If the trap site location does not already have an object serving as the scent post, place a clump of grass, large rock, upright stick or post, piece of wood or other eye-catching object so that the trap is positioned 8 to 10" downwind and 2 to 3" off-center to the right of the object (Fig. 15). Make the set appear as natural as possible, and after removing your gloves, place some coyote urine on the scent post object.

Figure 15. "Scent post" added before final sifting of dirt to hide the trap placement.

Step 6. Pick up the kneeling cloth and discard any unused soil away from the trap site. Make sure that the entire trap set appears natural before leaving (Fig. 16). As stated earlier, a variation of this set is to locate the trap site beside an existing prominent land object. This object can be any variety of existing land features such as a large rock, hay bale, lone tree, lone grass clump, or a fence post. The chosen object will be used as the "scent post" to simulate another coyote marking the object with urine. The trap is set and covered just like above. The center of the trap bed should be approximately 8 to 10" from the scent post object and 2 to 3" off-center to the right.

Figure 16. Completed Scent Post Set.

Baits, Lures, and Urines

Bait used for trapping can be purchased commercially or made at home. Certain baits may work better at different times of year than others, especially if trapping in warmer months. Trapping when fire ants are active may require the use of a liquid bait instead of a solid bait. Ants will readily consume solid bait, whereas a liquid-based bait can be placed on cotton or wool and this will prevent ants from removing the bait from the trap site.

Trapping bait can be made at home using commercial bait solutions purchased from most trap supply companies. Mix the bait solution with fresh or slightly tainted ground meat or small chunks of meat to make your own bait. Beaver,

bobcat, deer, rats and mice, beef, and even fresh road kill can be used. Bait making can also be a way to rid a freezer of outdated or freezer burned meats as well. A cheap, hand-turned meat grinder with a large grinding plate may be preferred over one borrowed from the kitchen for grinding meat for bait. Smaller rodents may even be ground whole. Sodium benzoate, a preservative agent, must be added to stop the decomposition process and for long-term storage. Unless otherwise directed by the label, mix 2 tablespoons (1 oz.) of sodium benzoate powder per pint of bait, or 1 cup per gallon of bait and mix thoroughly. Use more if the bait is heavily tainted. An easy way to taint meat is by leaving the meat unrefrigerated but well-covered to prevent flies from contaminating the product. As the meat begins to decompose, the odor from rotting begins. Tainted meat certainly smells a bit, but not so bad to where it is highly offensive. It's not recommended to let the meat taint too much, as it then may be more attractive to opossums and raccoons, or may prompt a coyote to roll in the set. Thus, many coyote trappers actually prefer fresh meat-based baits over tainted ones. Once the bait is thoroughly mixed with the solution and sodium benzoate, store the homemade bait in a glass jar for long-term storage, or divide it into smaller containers made of glass or plastic. For the first few days keep lid loose, but secure enough to keep out insects, so any gasses produced can escape. Then secure lid and wrap electrical tape around lid where it meets the container and store in a cool location. Most commercial bait solutions make about one gallon of bait.

Lures are usually a combination of animal glands and other ingredients added to be more of a scent lure than a food-based bait. Gland lures can prompt a territorial response or signal breeding availability.

Some lures are formulated to be used more as a curiosity lure, and these may contain beaver tail oil, beaver castor, or even skunk essence. These provoke the coyote to want to work the set because of the unusual smell from the lure itself. Use these judiciously as it can prompt rolling in the trap set (Fig. 17).

Fig. 17 Applying lure to a trap set.

Urine is commonly used in coyote trapping as it prompts canines to smell and often urinate on top of the urine that is already present. Much like walking your dog down the street which often leads to your dog urinating on fence posts, telephone poles, and mailboxes where other dogs have urinated, coyotes will do the same. Some trappers prefer red fox urine over coyote urine, thinking that young coyotes may be less likely to shy away from fox urine.

Checking Traps

Traps should be checked the following morning. By State law, traps must be checked *at least once daily from two hours before sunrise to two hours after sunset*. Reapply scent or bait after a couple of days at unsuccessful trap sites. To minimize human scent and disturbance to the trap site, only approach close enough to assess if an animal is caught or whether the trap site has been disturbed. Coyotes caught in traps should be dispatched with a single .22 caliber shot to the head. It is sometimes possible to catch additional animals at the same trap site; therefore reset the trap(s) in the same place, if possible. If resetting the trap in the same location, many trappers prefer to remove the animal from the trap circle using a catch pole before dispatch to minimize blood in the trap site. Other trappers prefer to move the trap to outside of the original catch circle, letting the scents from the catch circle serve as an additional attractant to the general trap site area.

Depredation Permits

Trapping is often the most practical solution to nuisance coyote problems. Persons without a commercial trapping license, or anyone trapping outside of the trapping season, may trap problem coyotes with a depredation permit. This permit is available from any SCDNR Wildlife Management or Law Enforcement office at no cost to the applicant. Depredation permits can also be issued to those without a hunting license in order to attempt to control coyotes through hunting or shooting.

Persons desiring to shoot coyotes at night may request a depredation permit to shoot at night outside of the normal night hunting provisions as described in the SCDNR Rules and Regulations brochure. However, not all shoot at night requests will be approved as location, practicality, and even the requestor's past history of natural resources violations may be considered. Any permits to shoot at night must come from the SCDNR Law Enforcement Section. Generally, Depredation Permits are valid for 30 days and can be renewed if additional time is needed to alleviate the situation.

Predator Management Permits

A Predator Management Permit (PMP) is available for a property owner desiring to trap coyotes outside of the trapping season as part of an ongoing wildlife management objective. These permits are intended for larger properties where hunting is the primary or major property use. PMP holders are required to comply with all current trapping rules and regulations and must keep a log of their activities. PMPs are issued only from the Furbearer Program and the Wildlife Permitting Office in Columbia. PMPs are valid from the end of the normal trapping season to the day before the next trapping season starts (March 1 to November 30). This permit is available at no cost; however, an annual permit activity report is required in order to renew the permit the following year.

Obtaining Permits

Any person (or their designee) may trap damage-causing coyotes within 100 yards of their *residence* without any license or permit from SCDNR so long as the trapping occurs on the owner's property, or with written permission of adjacent property owners (Fig. 18). *Nothing allows the trapping on the property of another without permission from the owner or occupant.* A free depredation permit is required to trap damage-causing coyotes outside of 100 yards of a person's residence where damage is occurring. A depredation permit will always be required to trap problem coyotes where there is no residence experiencing coyote damage, such as a livestock operation or other business.

For more information about obtaining a Depredation Permit or a Predator Management Permit contact the SCDNR Wildlife Permitting Office at (803) 734-3887, or by email at *wildlifepermitting@dnr.sc.gov*.

Fig. 18 Showing the 100-yard distance limit around a residence (hashed area) within the owner's property boundary where trapping can take place without permission of adjacent landowners and without any license or depredation permit.

Wildlife Control Operators

The SCDNR's Furbearer Project maintains a list of Wildlife Control Operators (WCOs) that can assist property owners with various nuisance wildlife problems for a fee. The amount charged is negotiable between the customer and the WCO, and will often depend on the distance traveled, number of trips required, time expended, and/or number of animals removed. The WCO list is available on the SCDNR website or at any SCDNR Wildlife Management or Law Enforcement Office listed in the back of this booklet. Further information about the WCO list can be obtained by contacting the Furbearer Project at (803) 734-3609, by email at *furbearerprogram@dnr.sc.gov*, or by visiting the SCDNR website at *dnr.sc.gov*.

Contact Information:

Furbearer Program	803-734-3609	Furbearerprogram@dnr.sc.gov
Wildlife Permitting	803-734-3887	Wildlifepermitting@dnr.sc.gov

Coyote Trapping Equipment Checklist

Traps

- ☐ Traps: Coil-sping foothold traps with 5 ¾" inside jaw spread or smaller.
- ☐ Earth Anchors: for anchoring trap, chain or cable. Softer soils need longer anchors.
- ☐ Trap Tags: Commercially made copper tags with name and address or SCDNR Customer ID printed on the tag. Legible handmade tags are OK. *Required by South Carolina State law.*
- ☐ Heavy-duty or Crunch Proof-style Swivels: (optional) to add middle swivel, will need bolt cutters for breaking trap chain.
- ☐ Quick Links: (optional) to quickly attach trap chain to earth anchor.

Trap Setting

- ☐ Digging Hammer: for digging trap beds and driving anchors (Sod Buster, Ground Hog, etc).
- ☐ Metal or Wood Sifter: for sifting dirt and blending sets.
- ☐ Trowel: for making dirt hole sets. Various sizes and shapes are available.
- ☐ Earth Anchor Driver: for driving earth anchors into the ground (may be anchor specific).
- ☐ Heavy Duty J-Hook Tool: for opening and closing J-hooks on traps and swivels.
- ☐ Trap Bag, Pack Basket, or Bucket: to carry traps and supplies. Carry bait, lure, & urine separated from traps.
- ☐ Kneeling pad, knee pads, and/or kneeling cloth: to keep clothes clean and reduce scent.
- ☐ Gloves: gloves for setting traps.
- ☐ Rubber Gloves: for applying baits, lures, & urine to prevent getting on hands or trap setting gloves.
- ☐ Poly-fil or Pan Covers: for keeping dirt from getting under trap pan.
- ☐ Long wooden Cotton Swabs: (optional) for applying lures.
- ☐ Sheep's Wool or Cotton Batting: (optional) for use in dirt hole sets.
- ☐ Drill Auger: (optional) used in cordless drill for dirt hole sets and retrieving earth anchors.

Trap Preparation

- ☐ Trap Dye or Dip: for preseason trapping preparation. Allow ample time to air out any scent after using dip.
- ☐ Trap Wax: for waxing dyed traps (optional).

Baits, Lures, & Urine

- ☐ Baits: Usually meat based bait for trap sets. Use liquid baits when fire ants are a problem.
- ☐ Lures: Usually a mixture of various animal glands and scents.
- ☐ Urine: Coyote and/or red fox urine.
- ☐ Bait Solutions: (optional) Commercially made solutions that are mixed with fresh or slightly tainted ground meat or small chunks of meat to make your own bait. Sodium benzoate preservative must be added as directed to stop the decomposition process and for long-term storage. Most commercial bait solutions make about one gallon of bait. Store homemade bait in a glass jar for long-term storage, or divide into smaller containers made of glass or plastic. Wrap electrical tape around lid where it meets the container and store in a cool location.

Animal Removal

- ☐ Catch Pole: For safely removing live animals from traps. Commercially made catch poles are approximately $75 to $100, but cheaper homemade designs can be found online using pipe and wire cable from a hardware store.

South Carolina Department of Natural Resources Offices

Wildlife Management Section

Region 1
311 Natural Resources Drive
Clemson, SC 29631
(864) 654-1671

Region 2
295 South Evander Drive
Florence, SC 29506
(843) 661-4768

Region 3
Columbia Office
1000 Assembly Street
Columbia, SC 29202
(803) 734-3886

Region 4
217 Ft. Johnson Road
Charleston, SC 29422
(843) 953-5291

Donnelley WMA/ACE Basin
585 Donnelley Drive
Green Pond, SC 29446
(843) 844-8957

Webb Wildlife Center
1282 Webb Avenue
Garnett, SC 29922
(803) 625-3569

Law Enforcement Division

DNR Region 1 Office - Clemson
311 Natural Resources Drive
Clemson, SC 29631
(864) 654-8266

DNR Region 2 Office - Florence
295 South Evander Drive
Florence, SC 29506
(843) 661-4766

DNR Region 3 Office - Columbia
1000 Assembly Street
Columbia, SC 29202
(803) 734-4002

DNR Region 4 Office - Charleston
217 Fort Johnson Road
Charleston, SC 29422
(843) 953-9307

SCDNR Website: www.dnr.sc.gov

United States Department of Agriculture

Wildlife Services
400 Northwest Drive
Columbia, SC 29203
(803) 786-9455

Furbearer Project
South Carolina
Department of Natural Resources
P.O. Box 167
Columbia, SC 29202
(803) 734-3609
E-mail: furbearerprogram@dnr.sc.gov
Website: dnr.sc.gov

Written by: Jay Butfiloski and Buddy Baker
Wildlife Biologists, SCDNR Furbearer Project

Expanded and Updated 2020
Jay Butfiloski, Wildlife Biologist
SCDNR Furbearer & Alligator Program Coordinator

Hand Drawn Illustrations by: Mark Conrardy
Photographs and computer illustrations by Jay Butfiloski, except where noted

Certain portions of this publication adapted from:

Green, J.S., F.R. Henderson, and M.D. Collinge. 1994. "Coyotes," pp. C-51 - C-76 in S.E. Hygnstrom, R.M. Timm and G.E. Larson, eds. Prevention and Control of Wildlife Damage. University of Nebraska Cooperative Extension Service, US Department of Agriculture - Animal Plant Health Inspection Service - Animal Damage Control, Great Plains Agricultural Council - Wildlife Resource Committee. Lincoln, Nebraska

WL 20-12602

Total Cost: $3,070
Total Copies: 5,000
Cost per copy: $0.614

Printed on Recycled Paper

Coyote Control - What a landowner CAN do in South Carolina

Hunting/Shooting: There is no closed hunting season on coyotes. Coyotes may be hunted year 'round on private lands with a valid hunting license. A free depredation permit can be issued to landowners that do not have a hunting license (see Depredation Permits). On private lands, coyotes may be hunted with any firearm during daylight hours at any time of the year.

Night Hunting Coyotes: Coyotes may only be hunted *at night* under the following conditions:

- By registering* the property with DNR online at: www.dnr.sc.gov/nighthunt
- In accordance to a DNR-issued depredation permit (see Depredation Permits section below)

**The landowner must register with DNR any properties on where night hunting activities for coyotes are going to take place. This registration is required annually as prescribed by DNR for each property. An annual summary of night hunting activities is required before a property can be re-registered the following year. This registration also allows for the night hunting of armadillos, feral hogs, and coyotes for every registered property. For more information see www.dnr.sc.gov/nighthunt . (SC Code of Laws §50-11-700 et seq.)*

Persons convicted of certain night hunting violations during the previous five years are ineligible to hunt coyotes at night (SC Code of Laws §50-11-715). *A permit is required from a local DNR Law Enforcement Officer for anyone to hunt or shoot coyotes at night on any property that is not currently registered for Night Hunting with DNR.*

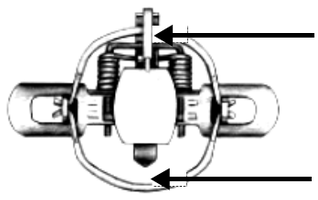
Bait, Electronic Calls: The use of bait and electronic calls is allowed for hunting coyotes during the day or night on private lands statewide. The use of any legal firearm, bow and arrow, or crossbow is allowed on private lands statewide.

Trapping: The normal trapping season for licensed trappers is Dec. 1 - Mar. 1. HOWEVER, a property owner may obtain a free depredation permit to trap outside of the normal trapping season and/or without a trapping license (see *Depredation Permits* section below for more information).

Legal Traps: ***(A separate Trapping Regulations brochure is available)***

- Snares: The use of snares is *illegal* for use in land sets. All coyote sets are considered land sets.
- Foothold traps: Trap size must be 5 3/4" or smaller for land sets (see Figure 1 below). All coyote sets are generally considered land sets.
- Live traps: In certain situations coyotes have been caught in live traps, but in general these traps are large and generally much less effective.

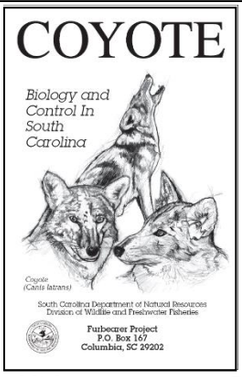
Except for licensed trappers during the trapping season (Dec. 1 – Mar. 1 and 30 days after), the possession and relocation of live coyotes is illegal!



Legal Foothold Trap Measurements:
Inside jaw spread at widest point perpendicular to pivot points

- 5.75" or smaller for land sets
- 7.25" or smaller for water sets

Figure 1. Measuring foothold traps



DNR publishes a separate Coyote brochure with biological information and additional control tips including trap preparation and trap set examples. This is also available online at:
http://www.dnr.sc.gov/wildlife/coyote/coyoteinfo.pdf

Depredation Permits: A depredation permit allows a property owner (or their designee) to trap or shoot damage-causing coyotes without any kind of license or season restrictions. The permit is FREE and available from any of DNR's offices or conservation officers. These permits may also be obtained over the phone. This permit will be good for 30 days for a specific site (such as Mr. Smith's farm).

- **The 100-yard Exemption:** Within 100-yards of the property owner's residence (so long as you are still on your own property), coyotes may be trapped or shot (if it is legal to discharge a firearm at the property's location) *WITHOUT ANY KIND OF LICENSE OR PERMIT*. This exemption applies to the property owner or his/her designee (such as a friend, relative, or any other person designated by the property owner).
- **Depredation Permits to shoot at night:** Except as provided under normal night hunting regulations as stated in the Hunting/Shooting section above, a depredation permit to shoot coyotes at night MUST be obtained from a local DNR conservation officer (check local firearms ordinances first). If you do not know a local DNR officer, contact the DNR at 803-955-4000 or 1-800-922-5431 and ask to have a local DNR officer contact you.
- **Predator Management Permits:** A special depredation permit to trap coyotes *for wildlife management purposes* and not for traditional depredation issues such as livestock losses and problems around the home. *This permit is specifically for hunt clubs and other large properties primarily used for hunting.* Only valid outside of trapping season (Mar.1 - Nov.30). Year end harvest report required. Issued by the Furbearer Project in Columbia Office.

Non-Lethal Options: These options are for reducing coyote damage without removing the coyote.

- **Cultural Techniques:** Confinement of livestock and small pets – especially at night - can lessen predation problems. Cleaning up brushy, grassy and weedy areas that attract small mammals (rabbits and rodents – a coyote's primary food source) can make your property less appealing to coyotes.
- **Guard Animals:** Certain animals have been successfully utilized as guard animals for livestock. Certain dog breeds (such as Great Pyrenees), donkeys, mules, and llamas have been used to protect livestock.
- **Wire Barriers:** Fences and fencing can prevent coyotes from entering an area if properly constructed. Buried aprons can prevent digging under a fence and overhangs or electric wires can prevent climbing over a fence. The DNR Coyote Brochure discusses fences in more detail.

Wildlife Control Operators (WCOs): For those property owners that wish to pay someone to trap coyotes for them (usually for a fee), the list of Wildlife Control Operators is available from any local DNR office or online at http://www.dnr.sc.gov/wildlife/control.html . These companies and individuals perform wildlife control services on a contract-fee basis. WCOs are not DNR employees and are not affiliated with the DNR. It is important to ask for references before hiring a WCO. Have all fees and guarantees in writing.

Questions: For more information about coyotes, legal issues, control techniques, trapping advice, or anything else coyote-related, contact the DNR Furbearer Project at 803-734-3609.

PROPOSED 48/96 SHIFT SCHEDULE

WHAT ARE WE PROPOSING?

- Isle of Palms Fire & Rescue personnel would like to transition from our current 24/48 shift schedule to a 48/96 shift schedule in January 2025.
- 83.87% of Isle of Palms Fire & Rescue personnel voted to move to a 48/96 shift schedule for a one-year trail period.
- After the one-year trial period, employees would vote to keep the new schedule or return to the 24/48 shift schedule with a super majority of 67% required in December 2025.
- This proposal is budget friendly as the hours worked over a three pay period cycle are the same as the 24/48 shift schedule. No increase in budget is required.
- Operational policies do not change. Staffing policies adopted from area departments best practices on mandatory overtime and unscheduled callouts.

BENEFITS EXPLAINED

3

Enhanced Continuity:

Longer duration shifts can create improved continuity in department operations as tasks that could not be completed on Day 1 can be completed on Day 2 with the same shift personnel.

Improved Work-Life Balance:

Firefighters are able to manage earned leave more effectively in order to connect with their family support system.

The current 24/48 shift schedule requires firefighters to work 33 single weekend days per year and provides 18 two-day weekends off per year.

The proposed 48-96 schedule requires firefighters to work 17 single weekend days per year and provides 26 four-day weekends off per year.

Five (5) more mornings at home per month. This allows firefighters a better work-life balance and provides the opportunity to assist with getting kids to school.

BENEFITS CONTINUED

4

Increased Job Satisfaction:

The longer rest periods and reduced frequency of shifts can contribute to higher job satisfaction, overall well-being among firefighters, leading to improved morale and retention and recruitment rates.

Reduced Commuting Time:

Commuting to and from work reduced by 50%, saving time, reducing transportation costs, reducing fatigue associated with daily travel and allowing greater opportunity for housing. This may also assist individuals who live further away to consider employment with our department.

Extended Rest Periods:

Firefighters work 48 hours and enjoy 96 hours (4 days) off duty. The extended rest period allows for mental and physical recovery.

CHALLENGES

- **FATIGUE MANAGEMENT**
- **OPERATIONAL COVERAGE**
- **WORK-LIFE BALANCE**
- **ADAPTATION**

CHALLENGES EXPLAINED

Fatigue Management:

Working a 48-hour shift can lead to fatigue, especially during emergency responses that require sustained physical and mental effort. Firefighters must manage their energy levels effectively to remain alert and capable of performing their duties safely.

Work-Life Balance:

While the longer periods off duty promote work-life balance, the extended shifts can still impact firefighters' personal lives, especially during consecutive workdays. Balancing shift commitments with family, social, and personal responsibilities requires careful planning and support systems.

Operational Coverage:

Maintaining adequate staffing levels and operational coverage during shifts, particularly during peak demand periods or emergencies, requires effective scheduling, resource allocation, and contingency plans.

Adaptation:

Transitioning to a 48/96 schedule may require adjustment periods for both firefighters and department leadership. Ensuring clear communication, support, and collaboration can facilitate a smooth transition and foster acceptance of the new schedule.

THANK YOU

Round-The-Clock Systems

The 24/7 Solutions Company™

24/48 VS. 48/96 WORK SCHEDULES: A COMPARATIVE ANALYSIS

Susan L. Koen, Ph.D.
President/CEO
Round-The-Clock Systems

Note: ***Dr. Koen is an organizational psychologist and globally-recognized expert on the topics of shift schedule design, safety & performance in 24-hour workplaces, and lifestyle strategies for shift personnel to achieve personal health and well-being.***

Two Portland Fish Pier, Suite 209, Portland, ME 04101-4633 ◆ Tel: (207) 828-5151 ◆ Fax: (207) 828-5156
Website: www.roundtheclocksystems.com ◆ Email: info@roundtheclocksystems.com

24/48 VS. 48/96 WORK SCHEDULES: A COMPARATIVE ANALYSIS

Over the last 10 years, there has been an increased drive to improve offtime patterns among shift employees in all types of North American industries. This drive has surfaced in U. S. fire departments as well, with the rapidly-expanding adoption of 48/96 work schedules. The 48/96 schedule consists of two consecutive 24-hour shifts on duty, followed by four consecutive offdays (or four 24-hour shifts off duty). While there are many obvious benefits to any shift schedule that increases consecutive offtime, the true nature of any shift system—both advantages and disadvantages—can only be determined in a comparative analysis. This document reviews the advantages and disadvantages of the 48/96 schedule in comparison to the 24/48 schedule, where a firefighter has one 24-hour shift on duty that is followed by two consecutive offdays. The key question to be answered here is this: does the benefit of more consecutive offdays provided by the 48/96 schedule create any negative costs in safety, health, on-duty performance, family distress or individual morale and job satisfaction?

KEY WORKPLACE CONCERNS: FATIGUE & SLEEP DEPRIVATION

The analysis of any shift schedule must begin with an assessment of the schedule's impact on firefighters' alertness and fatigue levels. Numerous safety studies have documented that a root-cause factor in human fatigue is the pattern of work and rest in the preceding seven-day period. For this reason, it is important to examine the **work:rest ratio** of a shift schedule. A minimum of a 3:4 ratio is needed to ensure that shift employees obtain a sufficient amount of rest and sleep in order to prevent cumulative physical fatigue as well as a sleep debt. The 24/48 schedule as well as the 48/96 schedule both have a 1:2 ratio, which is significantly better than the recommended minimum. Therefore, the structural design of both schedules supports employees' needed sleep and rest cycles.

A second factor to consider, however, is the **frequency of sleep disruptions** in an average night on duty. Sleep deprivation, defined as insufficient deep sleep or restorative sleep for the brain, causes cognitive or brain fatigue that can result in slowed reaction time, decreased vigilance and impairment in complex reasoning skills. Firefighters who experience one call during their nighttime sleep period (e.g., between 10:00 p.m. – 6:00 a.m.) typically will complete their first 24-hour workday in a state of mild sleep deprivation, depending on their ease of returning to

sleep and their total sleep length that night. With a 5-hour block of restful sleep and at least one 90-minute completion sleep, sleep deprivation can be avoided. Those firefighters who average two calls during a typical on-duty night will most likely be in a state of moderate sleep deprivation, where cognitive fatigue problems will begin surfacing. Having a second 24-hour on-duty day, without any opportunity for on-shift napping or restorative sleep, could put those firefighters at risk for some safety and performance challenges. If sufficient restorative sleep is obtained, however, a 48/96 schedule can be utilized without high risk. Firefighters at busy, mostly large-city stations that average three or more call-outs per on-duty night are likely to be severely sleep deprived at the end of their 24-hour workday. These stations should not consider a second consecutive 24-hour shift, as required in the 48/96 design.

FAMILY CONCERNS: QUALITY OFFTIME

Research on family distress among shiftworking households, including firefighters, have revealed that the offtime pattern of the shift employees' work schedule is the most significant determinant of family well-being. In other words, is the firefighter at home and positively interacting with his/her spouse, children and other family members often enough and for long-enough duration to be a viable family member? There are four key aspects of offtime schedules to consider. The first is the amount of **consecutive hours available to be a fully-present, active family member**. In the 24/48 schedule, many firefighters report that they have only one evening out of every three to interact with their family members, free of worries about preparing for the next on-duty day. By comparison, the 48/96 schedule provides three evenings out of each 6-day schedule cycle when the firefighter can attend to his/her family unencumbered by work concerns.

Two other offtime factors are the **amount and frequency of weekend offtime** afforded by the work schedule. With so many North Americans living in dual-earner households, where the non-shiftworking spouse most often has a weekday, day-shift job, weekends increasingly have become "prime time" for families. In this regard, numerous surveys have shown that family members prefer full weekends off as compared to split weekends where either Saturday *or* Sunday are scheduled offdays but not both. Full weekends typically enable families to travel away for recreation or visits with nearby family or friends, without children having to miss school or the spouse having to miss work. In comparing the 24/48 and 48/96 schedules on weekend offtime patterns, there is no doubt that the 48/96 schedule provides better quality weekends for firefighters and their families. First, with respect to Friday-night offtime patterns, firefighters on the 48/96 schedule work two Friday nights and then have four consecutive Friday

nights off. This Friday-night offtime pattern enables shift employees to engage with their children's school sports teams, most of whom play on Friday nights, for more consecutive weeks than does the 24/48 schedule. This opportunity is particularly valuable at the end of each sports season when post-season championship games are played in succession. As to Saturday and Sunday, the 48/96 schedule requires firefighters to work one full weekend out of every six (17%). However, this missed weekend is surrounded on either side by five consecutive weeks where the firefighter has one or both weekend days as off-duty days. Moreover, the trade-off benefit in this schedule is that 50% of the weekends or three consecutive weekends out of every six are full 2+-day weekends off. Contrasted with the one 2-day weekend off out of every three (33%) provided by the 24/48 schedule, there clearly is more weekend family time available on the 48/96 schedule.

The last offtime factor to consider is the **consecutive time spent away from spouse and children**. There is no doubt that a 48-hour on-duty assignment results in more consecutive time away from family members than a 24-hour on-duty assignment. In those families where there is high dependency on the firefighter for security, care and/or maintenance needs, the longer time away from the family will create heightened distress for both the family and the firefighter. In families where the non-shiftworking spouse functions with more independence, the consecutive offtime afforded by the 48/96 schedule will be viewed as more beneficial and valuable to the family unit, offsetting the negative feature of greater consecutive work time. Thus, the importance of this consecutive work time will vary based on internal family dynamics.

CONCLUSIONS

This comparative analysis has focused upon those features of the 24/48 and 48/96 work schedules that are known to cause challenges or bring positive benefits at work and at home. From this analysis, it is clear that the two schedules are the same in their overall work:rest ratio. The 24/48 schedule requires less consecutive time away from one's spouse and children, although the overall ratio of time at work and time at home are identical for these two schedules. Where the 48/96 schedule gains a more positive edge over the 24/48 schedule is in its offtime pattern. Specifically, the 48/96 schedule enables firefighters to be with their families for enough consecutive days to feel fully engaged in their home life. Being at home both days of the weekend, for half of the weekends of the year, adds further to this opportunity to be a vital, participative family member.

The one caution concerning the 48/96 work schedule, as compared to the 24/48 schedule, concerns the degree of sleep deprivation that firefighters are likely to have at the end of each 24-hour on-duty period. Those who are called out an average of once per night should have no trouble working a 48-hour assignment, especially if they are knowledgeable about how to return to good-quality sleep after their call. Those firefighters who receive an average of two calls per night would benefit from knowledge about split-sleep strategies and from time in their second on-duty day for a restorative (30-minute) nap or full (90-minute) completion sleep. Importantly, knowledge about effective sleep strategies can be obtained through shiftwork education courses, such as the widely-used **Shiftwork: How To Cope® Programs** (see http://www.roundtheclocksystems.com/product6_swhtc_intro.html).

Lastly, fire companies or truck units that have three or more calls per night, resulting in insufficient deep, restorative sleep for the brain to function effectively will be too sleep deprived to be safe and effective in their second 24-hour on-duty day. In this latter case, the safety and performance risks created by the 48/96 schedule outweigh the family, social and morale benefits of this schedule design. Alternative approaches to obtaining safety, positive performance and high-quality offtime, such as 4-crew, 12-hour designs, should be pursued in these high-volume fire companies.