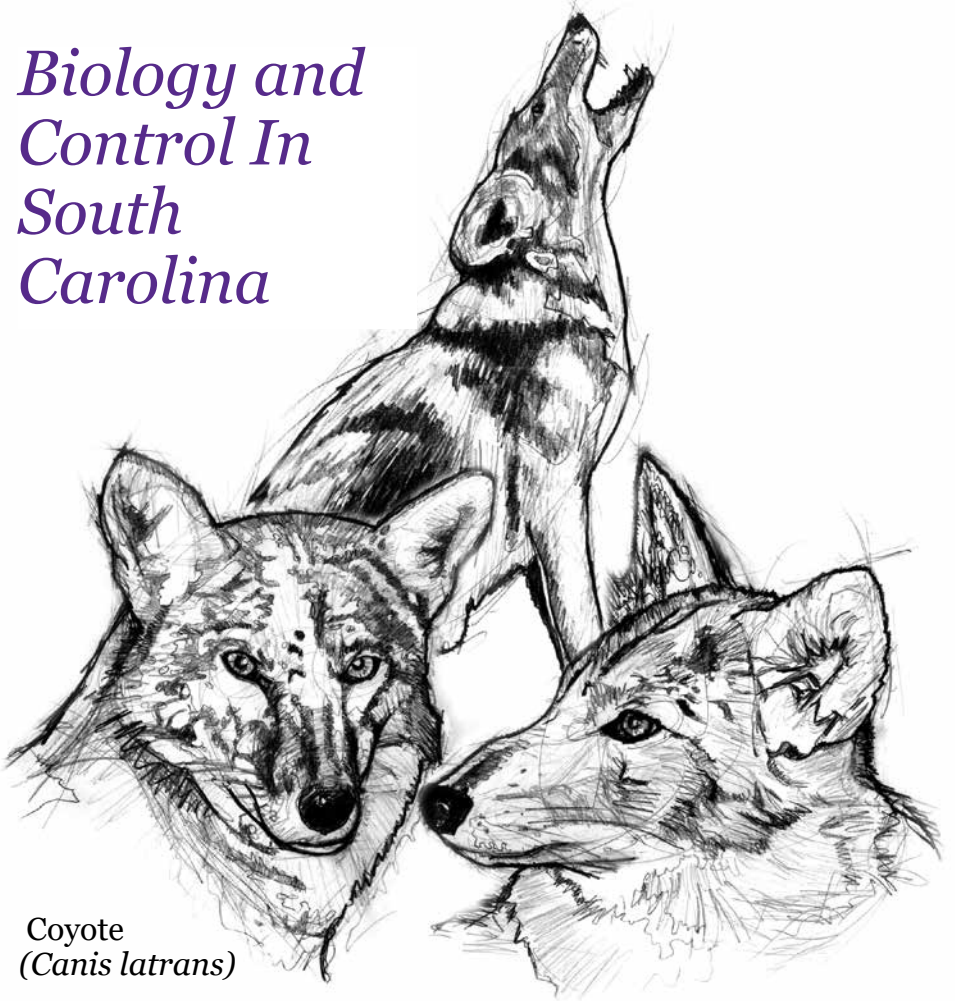


COYOTE

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

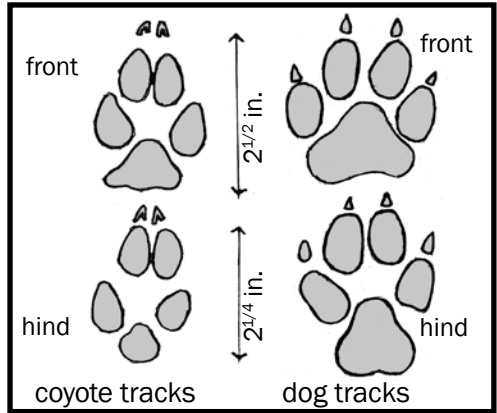
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BIOLOGY

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.

CONTROL TECHNIQUES

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.

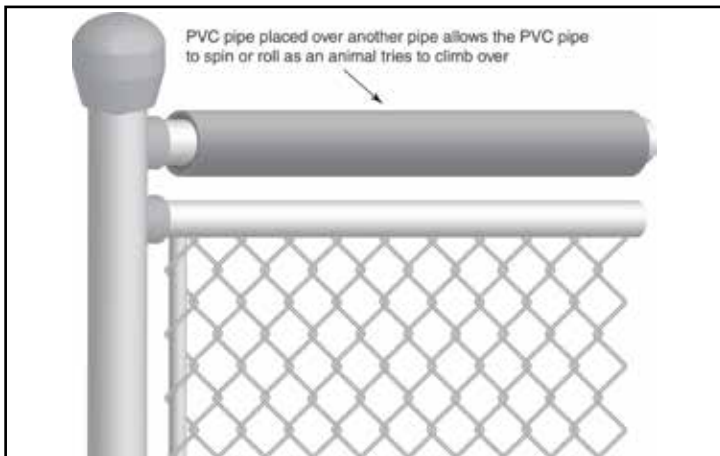


Figure 1. Fence rollers at top of fence to prevent climbing

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 $\frac{3}{4}$ 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

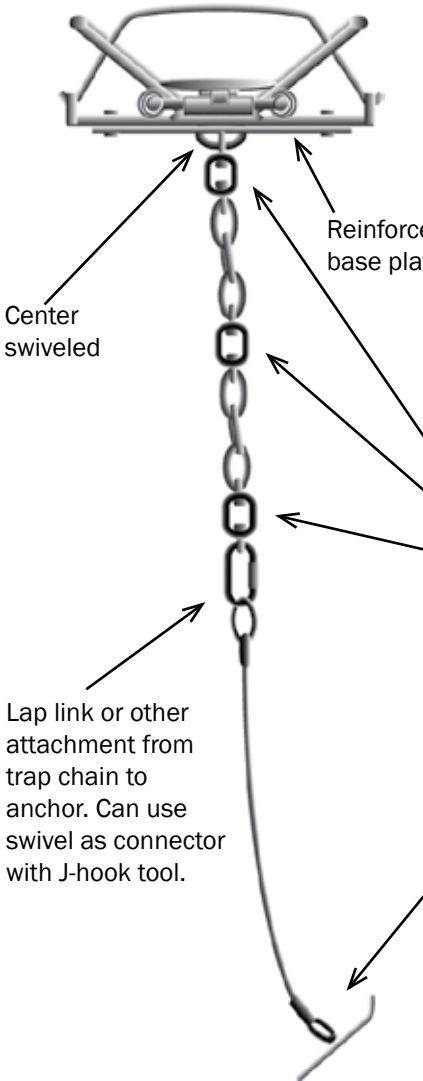
Examples of approved BMP foothold traps*:

- 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



At least 2, preferably 3 in-line swivels

Earth Anchoring System, (cable or chain) or double rebar stake with double stake swivel.

Length depends on soil type. Clay soils can have shorter anchors than sandy soils.

*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

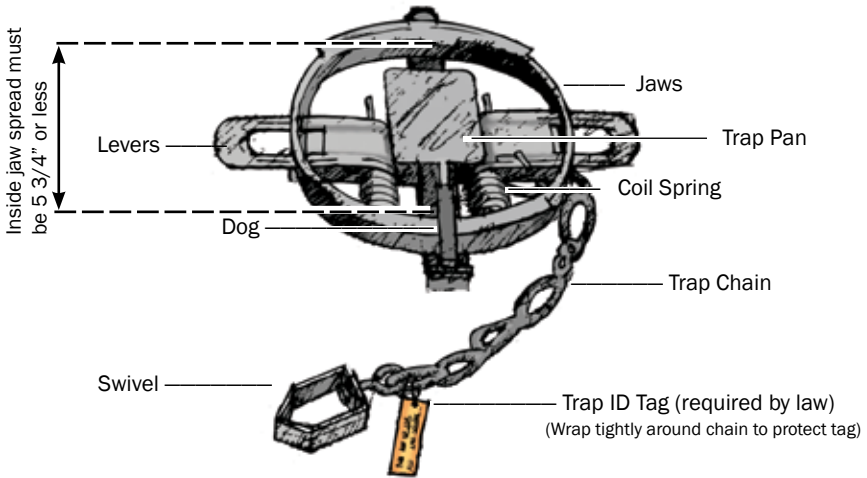


Figure 2. Parts of the coil spring foothold trap

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.

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).



Figure 3. Digging the dirt hole.

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-fill 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-fill 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-fill 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.

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



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 (hatched 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-spring 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 pre-season 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.

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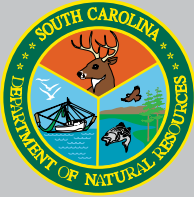
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