

FOXES



Figure 1. Red fox. Photo by Di Laubenstein, USFWS.



Figure 2. Gray foxes. Photo by Brandon M. Jones.

OBJECTIVES

1. Explain the key differences between the species of foxes.
2. Explain key elements about fox biology important for their control.
3. Describe typical home range for each species of fox.
4. Explain control options to clients.

SUMMARY OF DAMAGE PREVENTION AND CONTROL METHODS

HABITAT MODIFICATION

Remove potential food sources (e.g., pet food, bones, food scraps)

Control rodents around structures

Move trash indoors or secure trash cans to prevent rummaging

EXCLUSION

Cover window wells

Wire-mesh fences around crawl spaces

Secure poultry pens to prevent fox entry

Install 3-wire electric fences to protect livestock and poultry

FRIGHTENING DEVICES

Flashing lights and exploders may provide temporary protection

Well-trained livestock guarding dogs may be effective in certain situations

Llamas, alpacas, mules, and donkeys are effective livestock guards

REPELLENTS

Coyote or dog urine may serve as temporary repellents

TOXICANTS

There are no registered toxicants for use in Alabama.

FUMIGANTS

There are no registered fumigants for use in Alabama.

SHOOTING

Shotgun for close range shooting

Small caliber rifle (center fire .17 to .243 caliber) for longer range shooting

Properly trained hunting dogs

TRAPPING

No. 1.5 coil or No. 2 long spring foot-hold traps

Cable-restraints where legal

Cage and box traps

SPECIES PROFILE

IDENTIFICATION

The red fox (*Vulpes vulpes*) (Figure 1) is the most common of the foxes native to North America. Most depredation problems are associated with red foxes, although gray foxes (*Urocyon cinereoargenteus*, Figure 2) cause problems in some areas. Other foxes in North America include swift foxes (*V. velox*), kit foxes (*V. macrotis*), or arctic foxes (*Alopex lagopus*). Red and gray foxes are the only two species occurring in Alabama.

PHYSICAL DESCRIPTION

Red foxes are dog-like in appearance with an elongated pointed muzzle and large pointed ears that usually are erect and forward. They have moderately long legs and long, thick, soft body fur with a bushy tail (Figure 1). Typically, red foxes are colored with a light orange-red coat, black legs, lighter-colored underfur and a white-tipped tail. Silver and cross foxes are color phases of the red fox.

Gray foxes (a.k.a. silver fox) generally are salt-and-pepper gray with buffy underfur. The sides of the neck, back of the ears, legs, and feet are rusty yellow. The tail is long and bushy with a black tip.

Red foxes in North America weigh an average of 7.7 to 15.4 pounds, with males averaging 2.2 pounds heavier than females. They measure 34 to 62 inches from the nose to the tip of the tail. Gray foxes weigh 7 to 13 pounds and measure 32 to 45 inches from the nose to the tip of the tail.

SPECIES RANGE

The ranges of foxes often are limited by coyotes (*Canis latrans*) and wolves (*Canis lupus*), which intimidate and kill foxes. The range of the red fox has decreased as coyotes expand their range further east. The reduction of red foxes in an area is directly related to the number of coyotes in the area. Red foxes occur over most of North America with the exception of southern California, Arizona, central Texas, and a few isolated areas (Figure 3).



Figure 3. Red fox range. Image by PCWD.

Gray foxes occupy the eastern, north central, southwestern U.S. and Mexico (Figure 4). Their numbers are not impacted by coyotes to the same degree as red foxes.

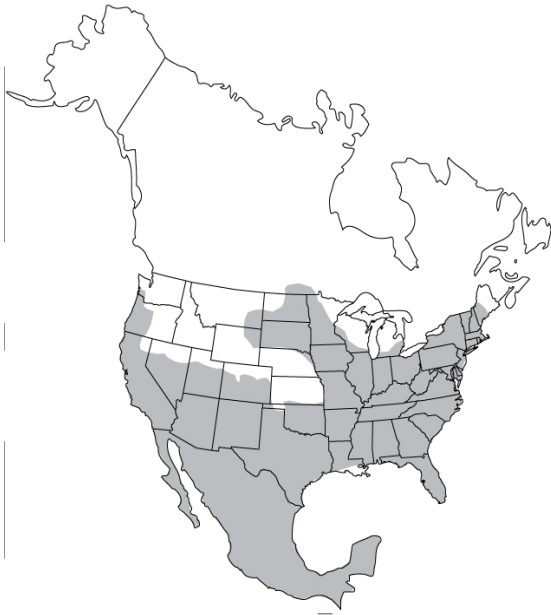


Figure 4. Gray fox range in North America. Image by PCWD.

VOICE AND SOUNDS

Foxes have a wide variety of calls. They bark, scream, howl, yap, growl, or make sounds similar to a hiccup. During winter, males often give a yelling bark (“æwo-wo-wo”) that may be an important territorial warning for other male foxes.

TRACKS AND SIGNS

It can be difficult to distinguish a fox track (Figure 5) from the tracks of other canines (members of dog family). Size is the most important demarcation. Trails of wild animals tend to be straight, while trails of domesticated animals tend to meander and zig-zag.

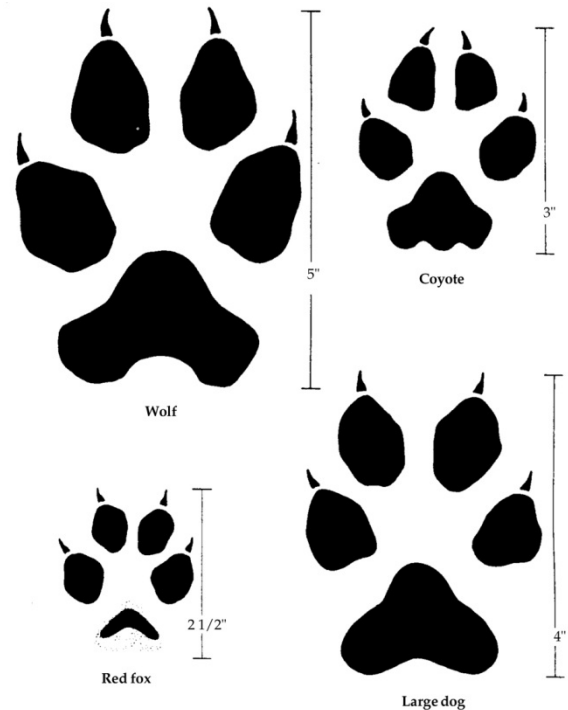


Figure 5. Comparison of canine tracks. Image by PCWD.

GENERAL BIOLOGY

REPRODUCTION

Foxes are solitary animals except during the winter breeding season through midsummer, when mates and their young associate closely. Mating in red foxes normally occurs from mid-January to early February. Estrus in vixens (females) lasts one to six days, followed by a 51 to 53-day gestation period. Fox pups are born from March in southern areas to May in the arctic zones. Red foxes generally produce four to nine pups per litter while gray foxes usually have three to seven pups. Foxes disperse from denning areas during the fall months and establish breeding areas in vacant territories, sometimes dispersing distances up to 245 miles.

NESTING/DENNING COVER

Red foxes dig their own dens or use abandoned burrows of woodchucks or badgers (Figure 6). The

same dens often are used for several generations. Gray foxes commonly use wood piles, rocky outcrops, hollow trees, or brush piles as den sites. Foxes mark their territories with feces and urine.



Figure 6. Den of a red fox. Photo by UNL.

BEHAVIOR

Foxes are crepuscular animals, most active during the early hours of night and very early morning. They do move about during the day, especially when it is dark and overcast. Foxes are active year-round. Predation tends to increase with the birth of young in the spring.

HABITAT

Red foxes adapt to most habitats within their range, but usually prefer open country with moderate cover. The highest reported fox densities have been in the north-central US where suitable habitat is interspersed within extensive farmlands. Red foxes have demonstrated their adaptability by establishing breeding populations in many urban areas of the US, Canada, and Europe.

Gray foxes prefer more dense cover such as thickets, riparian areas, swamp land, or rocky pinyon-cedar ridges. In eastern North America, gray foxes are associated closely with edges of deciduous forests. Gray foxes also are found in urban areas where

suitable habitat exists. It should be noted that gray foxes can climb trees.

FOOD HABITS

Foxes are opportunists, feeding on rabbits, mice, birds and their eggs, insects, and native fruits. Foxes usually kill animals smaller than a rabbit, although fawns, piglets, kids, lambs, and poultry sometimes are taken. Foxes have keen senses of hearing, vision, and smell that aid them in detecting prey. Foxes stalk even the smallest prey with skill and patience, usually ending with a sudden pounce on the prey. Red foxes sometimes kill more than they can eat and bury food in caches for later consumption. All foxes feed on carrion.

LEGAL STATUS

Foxes are listed as furbearers and a game animal in Alabama and most other states. Most states allow for the taking of foxes to protect private property. Alabama allows regulated hunting and trapping as well as removal of nuisance animals through a permit process. Contact a Division of Wildlife and Freshwater Fisheries district office for information regarding permits to take nuisance wildlife.

DAMAGE IDENTIFICATION

Foxes are stealthy and typically hunt dusk to dawn. They become more noticeable when young are born as the need for food increases dramatically. In the absence of physical signs, foxes are detected easily using commercially available trail cameras.

DAMAGE TO STRUCTURES

Foxes do not directly damage structures, but their burrows can lead to unpleasant smells and sites around a structure. Though able to dig, they are less destructive than woodchucks and badgers.

DAMAGE TO LIVESTOCK AND PETS

The protection of livestock and poultry from fox depredation is most important when adults are actively acquiring prey for their young during the spring denning period. Watch for signs of depredation during the spring, especially if there is a history of fox depredation. Foxes, like other wild canids, often return to established denning areas year after year. Foxes frequently den in proximity to human habitation. Dens may be located near farm buildings, under haystacks and patches of cover, and even inside hog lots or small pastures used for lambing. Dens may go unnoticed until excessive depredations have occurred due to the elusive nature of foxes. Trail cameras may be useful to monitor presence of foxes and other predators around livestock.

The practice of shed lambing and farrowing in protected enclosures can be useful in preventing fox depredation on young livestock. Removal of livestock carcasses from production areas can make these areas less attractive to predators.

Foxes may cause serious problems for poultry producers. Turkeys raised in large range pens are subject to predation by foxes. Losses may be heavy in small farm flocks of chickens, ducks, and geese. Young pigs, lambs, and small pets also are killed by foxes. Damage can be difficult to detect because the prey usually is carried from the kill site to a den site and uneaten parts are buried. Foxes usually attack the throat of young livestock, but some kill by inflicting multiple bites to the neck and back. Foxes do not have the size or strength to hold adult livestock or to crush the skull and large bones of their prey. They generally prefer the viscera and often begin feeding through an entry behind the ribs. Foxes also scavenge carcasses, making the actual cause of death difficult to determine.

Pheasants, waterfowl (Figure 7), other game birds, and small game mammals also are preyed upon by foxes. Fox predation may be a significant mortality

factor for upland and wetland birds, including some endangered species.



Figure 7. Duck killed by a fox. Photo by UNL.

DAMAGE TO LANDSCAPES

Foxes forage on berries and other fruits. Nuts, acorns, corn, and other grains are consumed less frequently. Foxes can cause significant damage to turf, notably golf courses, when digging for prey.

HEALTH AND SAFETY CONCERNS

Healthy foxes are not known to be dangerous to humans. Sick foxes (typically those infected with rabies) have attacked people. Attacks on small dogs (less than 20 pounds) may be common in urban and suburban areas.

Rabies outbreaks are most prevalent among red foxes in southeastern Canada and occasionally in the eastern US. The incidence of rabies in foxes has declined substantially since the mid-1960s for unexplained reasons. In 1990, only 197 reported cases of fox rabies occurred in the U.S. as compared to 1,821 for raccoons and 1,579 for skunks. Rabid foxes are a threat to humans, domestic animals, and wildlife.

Canine distemper is a viral infection that affects foxes. Clinical signs of this disease are similar to those of rabies. The disease is highly contagious and can be passed to domestic animals.

Red foxes are subject to mange, though gray foxes seem to be resistant. Evidence of infection is often revealed by loss of fur where the mites have burrowed.

DAMAGE PREVENTION AND CONTROL METHODS

HABITAT MODIFICATION

People should avoid feeding and watering pets outdoors. If this is not possible, such feedings should be restricted to what the pet can consume in one sitting.

Properly dispose of garbage or other food sources that will attract foxes. Foxes often are attracted to rodents living in barns, crawl spaces, sheds, and garages. Rodent control programs may be necessary to eliminate this attraction. Compost piles should be secured to prevent access to foxes and other wildlife. Window wells and egress windows (deeper than 12-inches) should be covered to prevent entrapment of foxes.

EXCLUSION

Decks and outbuildings with crawl spaces should be secured to prevent foxes from establishing a den under them.

Seal all ground-level openings into poultry buildings and close doors at night. Poultry yards and coops without subsurface foundations may be fenced with 3-foot wire-mesh. Bury the bottom of the fence 2 or more inches with an apron of net wire extending at least 12 inches outward from the bottom.

Foxes can be excluded from window wells (1 foot or deeper) or similar pits with mesh fencing or window well covers. Place beehives on stands 3 feet high. Install aluminum guards around the bases of hives if foxes attempt to climb the supports. Use tight-fitting lids to keep foxes out of garbage cans.

Construct net wire fences with openings of 3 inches or less to exclude red foxes. Fence should be at least 5 feet tall. When possible, a top or roof of net wire also should be constructed to exclude foxes because many will readily climb fences.

A three wire electric fence with wires spaced 6 inches, 12 inches, and 18 inches above the ground can repel red foxes. Bury the fence as described above. Combination fences that incorporate net and electric wires also are effective.

FRIGHTENING DEVICES

Foxes readily adapt to noise-making devices such as propane exploders, timed tape recordings, amplifiers, or radios, but such devices may temporarily reduce activity in an area.

Flashing lights, such as a rotating beacon or strobe light, also may provide temporary protection in relatively small areas or in livestock or poultry enclosures. Combinations of frightening devices used at irregular intervals should provide better protection than use of a single device because foxes may have more difficulty in adapting to random disturbances.

When properly trained, some dog breeds such as Great Pyrenees and Akbash dogs, have been useful in preventing predation on sheep. The effectiveness of dogs, even the 'guard dog' breeds, seems to depend on training and the individual disposition of the dog.

Several livestock including llamas, alpacas, mules, and donkeys also serve as effective guards. These species are aggressive and protective and will fend foxes away from other livestock, particularly sheep.

REPELLENTS

Coyote or dog urine has been used as a fox repellent, but the long-term effectiveness of this technique is questionable.

TOXICANTS

There are no registered toxicants for use in Alabama..

FUMIGANTS

There are no registered fumigants for use in Alabama.

SHOOTING

Foxes are attracted to commercially available predator calls which may be useful when attempting to shoot this species. If the animal is within 50 yards, a shotgun with buckshot is the preferred method of dispatch. A small caliber (e.g. .223, .22-250) rifle will be preferable at ranges from 50 to 400 yards.

TRAPPING

Trapping is a very effective and selective control method but a great deal of expertise is required to trap foxes effectively. Trapping by inexperienced people may serve to educate foxes, making them very difficult to catch, even by experienced trappers.

FOOTHOLD

Traps suitable for foxes are the Nos. 1 ½, 1 ¾, and 2 double coilspring trap and the Nos. 2 and 3 double longspring trap. Traps with offset and padded jaws cause less injury to confined animals and facilitate the release of non-target captures. State and provincial wildlife agencies regulate the traps and sets that can be used for trapping. Consult Alabama Game, Fish, and Furbearing Animal regulations for restrictions that pertain to Alabama.

Proper set location is important when trapping foxes (Figure 7). Sets made along trails, at entrances to fields, and near carcasses are often most productive. One of the most selective sets is the dirt-hole set. Dig a hole about 6 inches deep and 3 inches in diameter at a downward angle just behind the spot where the trap is to be placed. Place four to five drops of scent in the back of the hole. Move back from the bait hole and dig a hole 2 inches deep that is large enough to accommodate the trap and chain. Fasten the trap chain to a trap stake with a chain swivel and drive the stake directly under the place where the trap is to be set. Fold and place the chain under or beside the trap. Set the trap about ½ inch below the ground. Adjust the pan tension (amount of force needed to fire the trap) to fire at ¼ of the weight of the fox to reduce the capture of lighter, non-target animals. When the set is completed, the pan of the trap should be approximately 5 inches from the entrance of the hole with the pan slightly offset from the center of the hole (Figure 8).

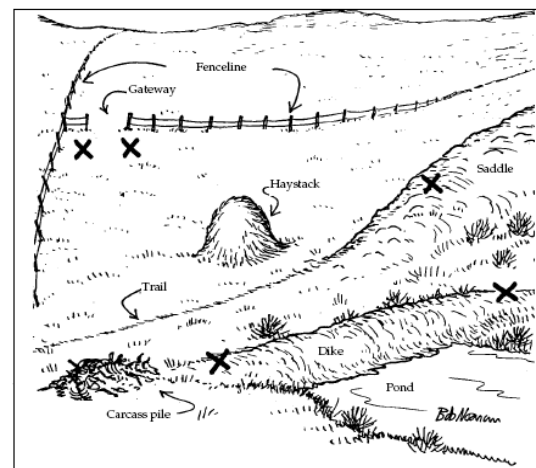


Figure 7. X's mark suitable locations for traps. Image by PCWD.

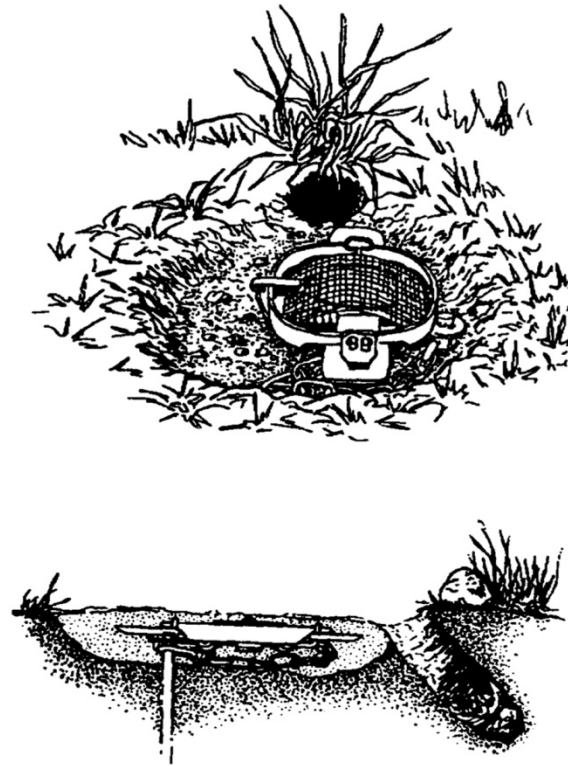


Figure 8. Top and side view of a dirt-hole set for fox. Images by PCWD.

Cover the area between the jaws and over the trap pan with a piece of waxed paper, light canvas, or light screen wire. If using waxed paper, crumple it first to reduce noise when a fox steps on it. The trap must be firmly bedded so that it does not move or wobble. The entire trap should be covered lightly with sifted soil up to the original ground level.

Fox scents and lures can be homemade with some knowledge of scent making as described in trapping books. Commercial trap scents can be purchased from most trapping suppliers. Experiment with various baits and scents to discover the combination of odors that are most appropriate for your area.

Equipment needed for trapping foxes includes traps, a sifter with a $\frac{3}{16}$ or $\frac{1}{2}$ -inch screen, trap stakes, trowel, gloves (which should be used only for trapping), a 16- to 20-ounce carpenter's hammer with straight claws, and a bottle of scent. Remove

the factory oil finish on the traps by boiling the traps in water and vinegar or by burying the traps in moist soil for one to two weeks until lightly rusted. The traps should be dyed with commercially available trap dye to prevent further corrosion. Do not allow the traps and other trapping equipment to come in contact with gasoline, oil, or other strong-smelling and contaminating materials. Cleanliness of equipment is necessary for consistent trapping success.

CAGE TRAPS

Cage traps (Figure 9) are effective for capturing foxes living in urban areas. Use a double-door cage-traps (42 x 8 x 8-inches) at den entrances.



Figure 9. Baited cage-trap for fox. Photo by Stephen M. Vantassel.

HANDLING

RELOCATION

Many states, including Alabama, have restrictions on relocation of foxes (release within the original home range). Due to potential health risks, Alabama prohibits the release of live foxes across a county line or major river drainage from where they were captured.

TRANSLOCATION

Alabama prohibits the translocation of foxes (release outside of the original home range) across a county line or major river drainage.

EUTHANASIA

Carbon-dioxide euthanasia is suitable for foxes. When performed properly, shooting the animal in the back of the skull or cervical dislocation are two additional humane dispatch methods.

DISPOSAL

Refer to Volume 1 of the National Wildlife Control Program and your state regulations regarding carcass disposal.

OTHER CONTROL METHODS

DIRECT CAPTURE

Foxes can be removed with catch-poles and cat graspers, in enclosed areas that restrict fox movement. Avoid their snapping jaws.

ACKNOWLEDGMENTS

We thank Norman C. Johnson, whose chapter 'Foxe' in the 1983 edition of this manual provided much of the information used in this section. F. Sherman Blom, Ronald A. Thompson, and Judy Loven (USDA-APHIS-Wildlife Services) provided useful comments.

AUTHORS

Robert L. Phillips

Wildlife Research Biologist
Denver Wildlife Research Center
USDA-APHIS-Wildlife Services
Denver, Colorado 80225-0266

Robert H. Schmidt

Associate Professor

Department of Fisheries and Wildlife
Utah State University
Logan, Utah 84322-5210

From the book, PREVENTION AND CONTROL OF WILDLIFE DAMAGE — 1994

Published by the University of Nebraska—Lincoln—Extension and the US Department of Agriculture—Animal and Plant Health Inspection Service—Wildlife Services

EDITORS OF THE NWCTP

Stephen M. Vantassel, Paul D. Curtis, Scott E. Hygnstrom, Raj Smith, Kirsten Smith, and Gretchen Gary

REVIEWERS

- Michael V. Cove, Department of Biology and Earth Science, University of Central Missouri
- Rob Beckman – Independent ADC operator

RESOURCES

KEY WORDS

Wildlife, wildlife control, damage management, nwco, fox

ON-LINE RESOURCES

<http://pcwd.info>

<http://icwdm.org>

QUESTIONS FOR REFLECTION

1. A client has noticed a red fox in the area and would like to reduce the chances of the fox living on his property. What would you advise?
2. A client is worried about a fox attacking his pet German shepherd. How would you respond?

3. A client wants a fox to be translocated. How would you respond?

DISCLAIMER

Implementation of wildlife damage management involves risks. Readers are advised to implement the safety information contained in Volume 1 of the National Wildlife Control Training Program.

Some control methods mentioned in this document may not be legal in your location. Wildlife control providers must consult relevant authorities before instituting any wildlife control action. Always use repellents and toxicants in accordance with the EPA-approved label and your local regulations.

Mention of any products, trademarks or brand names does not constitute endorsement, nor does omission constitute criticism.