

Managing Coyotes on School Grounds: *An Integrated Wildlife Damage Management Approach*

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In recent years, the number and density of coyotes in and around urban area has increased. Public awareness of this species as part of the urban landscape has grown, as well. Although coyotes rarely present threats to humans, it is essential that schools understand how to manage coyotes if they appear on their properties.

Management of nuisance wildlife is primarily designed to control the negative impacts rather than to punish or simply remove the animal. Integrated wildlife damage management (IWDM) recognizes the value of the animal and its role in the ecosystem—this management style seeks to prevent or mitigate damage or dissuade the animal from the nuisance activity. If this approach is not successful, then removal, whether lethal or nonlethal, must be considered.

The information herein can help school IPM coordinators address the presence of coyotes on school grounds. These techniques could also be applied by any individual or organization seeking to manage coyotes in or around human habitation and development. The following does not address the debate regarding coyotes in urban environments, municipalities choices on management ordinances, or diverse group interests on those topics. What you read below is simply scientific information to help ensure the safety of students at schools.

Identification

A coyote is about the size of a small collie. They have upright pointed ears, long legs, small paws, a pointed muzzle, and bushy tail. Coyotes are predominantly gray-brown to yellow-gray with a light gray to cream-colored belly. Most have dark or black guard hairs, that are especially noticeable down their back, tail, and over their shoulders. Characteristics that distinguish coyotes from domestic dogs include a long, pointed nose, sharp ears, their gait, and the way they carry their tail.

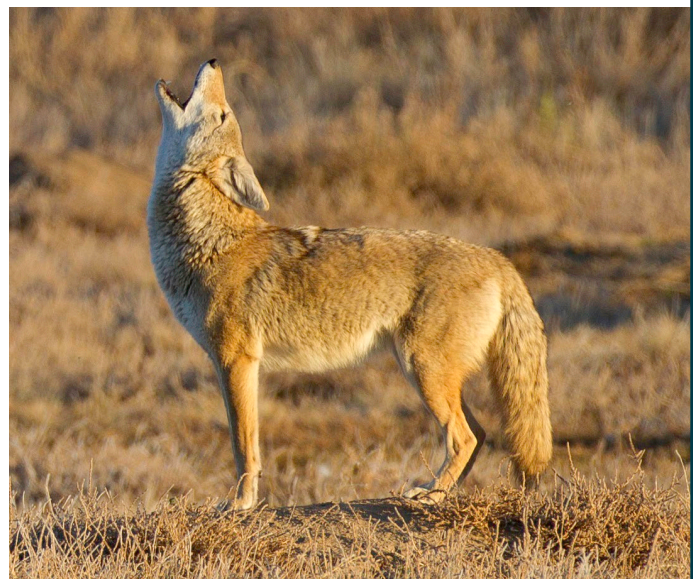


Figure 1. A coyote howling. Photo source: USFWS

General ecology

The coyote is a medium-sized carnivore of the canine family. It is native to North and Central America, and most resembles jackals in size and behavior. Coyotes typically weigh 8 to 40 pounds and much of this variation depends on climate and diet. Most will fall in the middle of this range. Although they are lightweight, their fur makes them look deceptively large.

Coyotes are omnivorous. They eat rodents, rabbits, berries, fruits, and insects; their food sources shift according to the seasons of the year. In urban environments, human-based food sources such as food waste, pet food, and other sources influence a coyote's diet.

A coyote's lifespan averages 5 to 8 years. They have a single litter of up to 13 pups annually, starting in their second year. Coyotes breed as early as late January, and as late as mid-March. Breeding usually peaks in mid-February. Coyotes in dens and with young pups may be especially defensive and territorial.

Coyotes maintain their territories by vocalization, scat, and urine deposition. Young animals disperse in the Fall and Winter, and are usually not territorial until their second fall. In any population, there will be territorial coyotes (2 years and older), nonterritorial yearling coyotes, and young-of-the-year. Therefore, one might see transient coyotes (which rarely cause problems) during any time of the year. In good habitat, if territorial coyotes are removed, transients will quickly adapt and fill the vacant territory.

Coyotes are an important part of the ecosystem, and like all wildlife, they should not be treated as pests just because they are present. They can be a source of wonder and interest for students. However, if they become habituated towards humans, they can be a threat to student safety at schools. Therefore, school IPM coordinators must monitor coyote presence and behavior to determine if management action is needed.

Suggested thresholds

Managers must establish their own behavioral thresholds. Coyote behavior that is acceptable in rural areas may not be in urban areas. Again, long-term close coexistence may lead to human-habituated animals that pose a threat to human safety. Ideally, coyotes will not be seen on school grounds while people are present. It is critical to categorize coyote behaviors as they relate to humans when determining which management action is appropriate, and when lethal control may be necessary.

School IPM coordinators may ensure that there are no coyotes present on school grounds through continued monitoring and inspection. These monitoring methods may be easily integrated into TEKS-aligned science projects. Please contact the Texas A&M AgriLife Extension Service's Wildlife Unit (<https://wildlife.tamu.edu>) for information on how to include wildlife monitoring in classroom curriculum.

Monitoring and inspection

To determine the presence of these animals on or around school grounds, you can inspect for tracks and scat, and you can monitor trail cameras. Although it is tempting to treat howling as evidence of coyote presence, this can be misleading in terms of distance from listener and the number of animals. The techniques below are more definitive.

Tracks:

Coyote tracks are easy to recognize. Coyote footprints are oval shaped and are approximately 2.5 inches long by 2 inches wide. They show four toes with claws on front and hind feet. Normally, only the claws of the middle two toes register, although in soft ground all four will appear.



Figure 2. Coyote print in mud..
Photo source: Anne Parsons, CC BY-NC 4.0

Scat:

Coyote scat has a generally twisted, ropelike appearance. It tapers to fine points on both ends, and may include seeds, grass, bones, and hair. It is easily distinguished from bobcat scat by the presence of longer hairs and grass, as well as its non-segmented form. Scat is usually $\frac{1}{2}$ to 1 inch in diameter.



Figure 3. Scat. Photo source: Mark Kluge, CC BY-NC-ND 4.0

Remote cameras:

Remote cameras can be placed around the property to monitor coyote movements. These are excellent additions to science classes. Place the camera at a 45-degree angle across a path or trail, and roughly 18 to 30 inches above the ground. You can limit the number of false triggers by clearing vegetation that might blow in the wind in front of the camera. Locations should focus where scat has been observed or pathway intersections.



Figure 4. Coyotes at night. Photo source: Cullen Hanks

Categorizing behavior

Coyote behavior can be categorized through observation and monitoring. The Timm-Baker scale provides a continuum that ranges from wild to human-habituated (Timm and Schmidt, 2007). It is critical to understand and classify the behavior of wild animals that are of management concern. Unlike insect pests, wild animals are intelligent—they can learn and change behavior over time. The scale summarized below includes a level at which you should involve professional animal control. Coyotes that are observed minimally, and mostly at night, do not register on this scale. However, without management, human-habituated coyotes may progress along this scale rather rapidly.

- Level 1:** *Increased observations of coyotes in yards and streets during the night.*
- Level 2:** *An increase in coyotes approaching adults and/or taking pets at night.*
- Level 3:** *Observing coyotes in streets, yards, and parks in the early morning and afternoon daylight hours.*
- Level 4:** *Coyotes taking or chasing pets during daylight hours*
- Level 5:** *Coyotes attacking or taking pets on leashes in proximity of humans; chasing joggers, bicyclists, or other adults.*
- Level 6:** *Activity in children's areas (schools, playgrounds, etc.) during daylight hours*
- Level 7:** *Coyote aggression towards adults mid-day.*

Below Level 4, most experts and municipalities advise the use of aversive conditioning (described below) to teach coyotes to avoid humans. At or above Level 4 is typically where municipalities engage in lethal removal of offending animals. As the behaviors progress, the likelihood of human, particularly child, attack increases.

Management approach

There many management tools available for coexisting with coyotes. We detail these below, but reiterate that with integrated management of nuisance

animals, each tool has its time and place. Certain regulations, ordinances, and cultural positions may dictate which are legal and/or desired.

The desire to trap and relocate, rather than euthanize animals, is increasing. However, trapping and relocating coyotes is neither highly effective nor necessarily humane. Relocated animals often do not survive the transfer. If they do, they tend to move into other locations and may cause further problems. Sometimes relocated coyotes go to great lengths to return to known territory or may adversely affect residents at the relocation site. Often, when territories are cleared, they are soon reoccupied by transient coyotes or nearby packs.

Cultural management

The appropriate time to consider habitat modifications is before coyotes establish in or near a school. Coyotes are attracted to an environment that provides habitat for them. In suburban and urban areas, there are ways to make the landscape less hospitable to coyotes:

Habitat modification:

Clear brush and other plants from under trees. Remove debris such as wood piles, trash piles, and neatly stack materials, such as lumber and pipe. This creates a more visible landscape that minimizes places for coyotes to move under concealment. Coordinate with neighbors and other

authorities to increase the coyote management area adjacent to school grounds.

Fencing:

One of the best, long-term solutions to coyotes on school grounds may be to maximize the effectiveness of fencing. While a determined coyote may penetrate common livestock fencing, a strong 6-foot chain link perimeter will deter most wildlife, including coyotes. The bottom of the fence should touch the ground in all places to keep coyotes from crawling under. Security gates that roll across pavement at access points should be closed after hours to prevent coyotes from entering the school grounds. While the initial cost of such fencing may be high, they provide long-term benefits in terms of wildlife management and school security.

Food removal:

People are often the source of supplemental food for pets and wildlife. Food sources that are consistently available are a problem for coyote management. Pet food intended for domestic pets or feral animals, bird seed, or improper disposal of human food waste can attract coyotes and increase human habituation. These food sources should be removed, and the school IPM coordinator should monitor the property to ensure no food is accessible. It is also essential to coordinate with neighbors to eliminate food from their properties.

Rodents and rabbits may be present in great numbers in areas such as lawns, parks, cemeteries, and sports fields. A coyote population might subsist on these species. School IPM coordinators likely would not have the authority or time to manage these animals in all areas.

Water removal:

If supplemental water is provided for wildlife on the school property, it is important that it be as unavailable as possible to coyotes. Water features such as fountains and pools may impossible shield from coyotes, but making the water unpalatable with increased levels of salt or chlorine is an option. This should not be toxic to other wildlife or students, but can deter coyotes.



Figure 5. Coyotes at night. Photo source: Tim Giller, CC BY-NC 4.0

Aversive conditioning

Hazing, harassing, and otherwise “running off” coyotes from school grounds is the preferred method for preventing coyote habituation on school grounds. The Timm-Schmidt Scale, referenced above, uses research to define the progression of coyote behavior related to human-habituation.

Hazing methods include noise- and light-making devices, physical harassment (including throwing objects, paintball guns, etc.), and any other activity designed to startle the animal and make it retreat. Based on monitoring, a combination of hazing methods may be needed. Motion activated lights and noise makers can be used after hours—trained adults should monitor the grounds during the day and, if necessary, use hazing techniques when school is in session.

Mechanical management

Removing coyotes by mechanical means generally involves some type of trap. These may or may not be lethal and each carries risks and benefits. All traps should be placed where school children will not encounter them and the risk to non-target animals is minimal. School IPM Coordinators should check with municipal and county authorities to see if there are regulations governing mechanical methods. Schools generally contract professional assistance in setting traps.

Foothold traps:

Traditional foothold traps can be placed alongside trails and other areas that coyotes frequent. These traps are placed a single step-length back from a scent-based attractant. The trap springs when stepped on and holds the animal until the trapper arrives to euthanize and remove them. Approved coyote traps come in rubber-padded and offset jaw varieties. Padded and offset traps are considered less injurious, although rubber should not be employed when temperatures remain below freezing. In cold weather the rubber restricts blood flow which will result in numb toes and frozen tissue.



Figure 6. A coyote sleeping on a rock. Photo source: Btcgeek, CC BY-SA 4.0

Snares:

Snares are a trap constructed from braided steel cable. These are set on known travel pathways, especially at under-fence crossings and on brushy paths. The animal steps up to the snare and, when travelling through, is caught by the neck or around the body. Some animals may not be dead from being snared and will require euthanasia.

One type of snare uses a mechanism that throws a large-diameter cable over the head of the animal, pulls it taught, and has a metal stop on the cable to prevent strangulation. These are considered extremely humane and non-injurious. However, they can be difficult to set, and still require that the animal be removed or euthanized.

Cage traps:

Large cage traps may be considered for coyotes that are extremely habituated to a human dominated landscape. Normally, the natural wariness of a wild coyote would keep it from entering a cage trap. However, for coyotes which have become accustomed to receiving food from humans, a cage trap may be considered. The trap should be large enough to allow the coyote to enter completely (60 × 20 × 26 inches). Soil should be placed on the wire floor of the trap to make entry more normal. A strong food lure, similar to what they have been fed, should be secured in the back of the trap to ensure the coyote triggers the trap. Cage trap success is typically very low and many nights may be spent trying to get the coyote to enter the trap.

Chemical control

While the M-44 device is registered for coyote management, it can only be used where exposure to the public is not likely. The M-44 device should not be considered for coyote management on or near school property.

When removal is the best choice

In many cases, school officials notice coyotes at or near the point of action on the Timm-Baker scale. At that point and to protect student safety the most common management decision is lethal removal.

Service providers are available to remove coyotes that have exceeded the threshold for action. You may have access to municipal or county animal control officers. You can also ask Texas Wildlife Services program for support in lethal removal methods. However, not all counties participate in this program.



Figure 7. Coyote in an urban area. Photo source: wilddallas, CC BY-NC 4.0

Evaluation methods

A decrease in the activity of coyotes on the property signifies that your management program is successful. If aversive conditioning is successful, the animals should revert to below Level 1 on the Timm-Baker scale. Continued monitoring of scat, tracks, and camera data will reveal whether a given management approach has achieved its goal.

Conclusions

Urban wildlife becoming habituated to humans is an increasing management challenge. In cases where urban wildlife can potentially be injurious to humans, especially children, it is essential to provide management methods to those tasked with their safety.

The simplest way to prevent coyote problems is to use good fencing for a consistent, secure property border. Hazing and aversive conditioning should be used when coyotes appear on property, but you should continue to improve fencing and secure the property. Removing animals by mechanical means should be considered only when habituation has occurred, and the safety of students and the public is in question.

A qualified professional can provide additional guidance. Contact the Texas Wildlife Services or the Texas A&M AgriLife Extension Service for more information.

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