project
coyote

PROTECTING WILD CARNIVORES
FOSTERING THRIVING ECOSYSTEMS

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Coyote Coexistence Plan

Produced by Project Coyote | 2025

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ACKNOWLEDGMENTS

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INTRODUCTION

This plan fosters human–coyote coexistence in an urban context[1]. The goals of this plan are:

- An increased holistic (ethical and scientific) education that fosters understanding and appreciation of coyotes, leading to improved human-coyote relationships and reduced conflict

- The widespread implementation of science-based conflict mitigation measures focused on human behavior modification and reducing attractants

- An efficient, effective and triaged response to conflicts by government officials that strives for harm mitigation to humans, domesticated animals, and coyotes

To that end, the components of this plan are:

- Educational information on coyote well-being, intrinsic value, behavior, ecology and responsible coexistence

- A coexistence strategy foregrounding monitoring and data collection, holistic education and public outreach, and reduction of public and private attractants

- Tiered and triaged behavioral modification of both humans and coyotes, with a focus on humans

- Tiered and triaged non-lethal responses to assertive coyote behavior

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1   The 'urban' area includes everything from the busy city center to the less populated outskirts. This area covers suburbs and semi-rural exurbs, all connected to the main city through work, commuting, and other ties. The key feature is a large city or town at the center, with surrounding areas that rely on it economically and socially.

Coyote Coexistence Plan

Enactment of the tiered and triaged responses requires active participation by the entire community including public administrators, contracted staff, residents, homeowners' associations, and volunteers.

This plan is based on the best-available scholarly research and best practices, and includes a full spectrum of tools. Basic guiding principles include:

1. *Human safety is a priority when addressing human-coyote interactions.* Because coyote attacks on humans are rare, emphasis is placed on reducing misperceptions of risk from coyotes and mitigating risk of negative interactions.

2. *'Do no harm' is a priority in responding to human-wildlife interactions.* All animals, including coyotes, have intrinsic value; they are valuable as ends in themselves, and value their lives and relationships. Therefore, conflict responses focus on triaged, non-lethal methods to mitigate harm to coyotes. Harm mitigation also aligns with the broad public's increasing concern with animal well-being.

3. *Urban wild lives and their habitats are essential and valuable components of the local ecological and socio-economic community.* Many coyotes call cities their home, and not only are they able to thrive in them, but also contribute to the community of life when they do. Coyotes are top-down ecological regulators that contribute to a variety of ecological processes such as limiting mesocarnivore (e.g., foxes, feral cats), rodent and rabbit populations, and consuming carrion, through which they benefit ground-nesting birds, help control disease transmission, reduce grain/crop losses, and clean up ecosystems. By respecting coyotes' self-determination, relationships, and allowing for their thriving, we reciprocate their in-kind contributions to our well-being.

4. *Coexistence techniques and decisions must be based on a thorough understanding of the behavior, biology and ecology of urban coyotes.*

5. *Conflict mitigation will emphasize the least harmful, preventive practices, and focus on modifying human behavior,* including reduction and removal of wildlife attractants and appropriate human responses to negative interactions, such as hazing.

6. *The killing of coyotes not involved in conflicts (i.e. indiscriminate killing) dismisses their intrinsic value and has been proven counterproductive for conflict mitigation, coyote population regulation, or improving ecological processes and associated ecosystem benefits.*

7. *Frequent, community-wide education and communication are essential* in supporting human and animal well-being, and in promoting their coexistence.

8. *All endeavors to promote coexistence necessitate compassion, respect and fairness.*

The guidelines and provisions of this plan do not supersede federal, state and county laws, regulations, and policies.

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LIVING WITH WILD ANIMALS

Urban spaces are also wildlife habitats. Within such shared spaces, in the absence of adequate education, conflicts between people and wild animals tend to be exacerbated as humans appropriate space and simultaneously generate **attractants** for wild animals (e.g., leaving garbage exposed, intentional wildlife feeding, increase in prey populations). Contributing factors to such perceived and actual conflicts are:

- dismissive beliefs and misconceptions about, and negative values, perceptions and attitudes towards animals;

- increased human appropriation of wildlife habitat and resources;

- a lack of knowledge about animal behavior;

- inappropriate human behavior towards wild animals; and

- lack of resources for or education about adequately securing attractants, especially within lower income urban communities.

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"[R]obust coyote populations may offer wildlife managers a novel tool, albeit a difficult one to control, for manipulating wildlife... the presence of a few coyotes may allow for dramatic increases in waterfowl, songbird, and game bird populations."
(Gompper et al. 2002)

Matt Knoth #CaptureCoexistence

Conflict occurs when the presence or behavior of wild animals or humans (and their pets) poses an actual or perceived threat to the others' interests and needs. Both situations usually lead to disagreements between people about how to respond, and to negative interactions within human communities and with wild animals. Addressing conflicts, especially with coyotes, is a high priority for wildlife officials and residents concerned about such interactions or that have been involved in conflict(s) with wild animals. The experience of perceived or actual conflicts may also result in a reduced tolerance for urban wildlife (Poessel et al. 2017b). Wildlife professionals should be attentive to such concerns and have an established, proactive plan for addressing them before they become an issue of high priority. The City of [NAME] values the presence of wildlife and recognizes the need to reduce conflicts through the development of wildlife coexistence plans.

In addressing urban wildlife coexistence, optimal public policy will proactively prevent conflicts and will implement remedial measures that do not harm wildlife or their habitat. Harmful or lethal interventions are ineffective and potentially counterproductive. For example, trapping and relocating coyotes, or indiscriminately killing them, is harmful to coyotes, and research suggests it is often ineffective or counterproductive for reducing conflicts in addition to ecologically unsound (see sections on **Non-lethal** and **Lethal Inventions** below).

Instead, proactive educational and preventative actions should be disseminated across the community, and in the case that proactive measures fail to resolve a conflict, then triaged non-lethal measures should be employed. Non-lethal deterrents are preferred; they are less harmful, tend to be more effective and do not cause the social disruption in coyote populations that may lead to subsequent conflicts. For example, conflict cases involving human behavior (e.g., leaving garbage exposed, unsupervised companion animals or intentional wildlife feeding) can be resolved by foregrounding human responsibility to mitigate conflicts through enacting ordinances, providing enforcement to uphold such ordinances, and requiring that such ordinances are followed before considering any harmful reactive intervention(s) towards wild animals. In cases of an actual, as opposed to perceived, threat to human safety, this plan will provide protocols for responding through a triaged, precautionary framework that seeks to forestall and mitigate harm to humans, domestic and wild animals.

Coyotes (Canis latrans)

Coyotes (*Canis latrans*)

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Coyotes, our unique Song Dogs who have existed in North America since the Pleistocene, are the most persecuted native carnivore in North America, with over half a million coyotes killed every year in the U.S. (more than one coyote per minute; USDA-APHIS, 2022). Native American observers and animal behaviorists have helped uncover these intelligent canines' rich cognitive, emotional, moral, and social lives (Bekoff 2010, Cooper 1987, Way 2007). Coyotes are known to display a wide range of emotions, including playfulness, curiosity, and grief, as evidenced by: their documented play behavior, distress when facing threats or injuries, and their mourning behaviors when a member of their group passes (see also **Social Structure** below).

However, negative stereotypes and fallacies malign coyotes wherever they go. Unlike many predators who face extinction, coyotes continue to survive and thrive in the face of persecution. Their survival is attributed to their remarkable intelligence, adaptability, and emotional resilience, traits many Native Americans revere in coyotes.

A vital part of both our rural and urban landscapes, coyotes' ability to adjust to changing conditions and diverse environments sets them apart and makes them difficult to pigeonhole, perhaps further contributing to people's fear and misunderstanding.

In their intelligence and adaptability, coyotes teach us about our own capacity to evolve and coexist in the face of rapid ecological and social change. By helping to shift attitudes toward coyotes and other wild carnivores, we replace fear and ignorance with understanding, appreciation, care, and respect.

Coyotes (*Canis latrans*)

APPEARANCE

Western coyotes typically weigh 18 to 30 pounds and are similar in size and coat color to a Shepherd or collie-type dog, but with pointed, erect ears (Bekoff & Gese 2003). Coyotes have a long, bushy, black-tipped tail that is usually carried pointed down. Their eastern counterparts can be larger, averaging 35-50 pounds, as a result of interbreeding with eastern wolves and domestic dogs, which may increase with current wolf killing (Monzón et al. 2014, Pfeffer et al. 2022, Rutledge et al. 2012, Way & Lynn 2016). Coyotes are usually grayish brown with reddish tinges behind the ears and around the face, but coloration can vary from silver-gray to black (Mowry et al. 2014). They have longer, denser fur coats during colder months and sport a lighter and shorter undercoat in the summer, which make them look much leaner and smaller.

The Western Coyote on the left (photo by Frank Schulenburg #CaptureCoexistence) has a longer muzzle and longer ears than the Eastern Coyote on the right (photo by ©Ed Hughes).

Western Coyote
Canis latrans

Height (from shoulder)
20—26 inches

Weight
22—45 lbs

Domestic Dog: Labrador
Canis lupus familiaris

Height (from shoulder)
21—24inches

Weight
55—80 lbs

Eastern Coyote
Canis latrans orientalis

Height (from shoulder)
21—26 inches

Weight
35—50 lbs

Grey Wolf
Canis lupus

Height (from shoulder)
25—32 inches

Weight
60—145 lbs
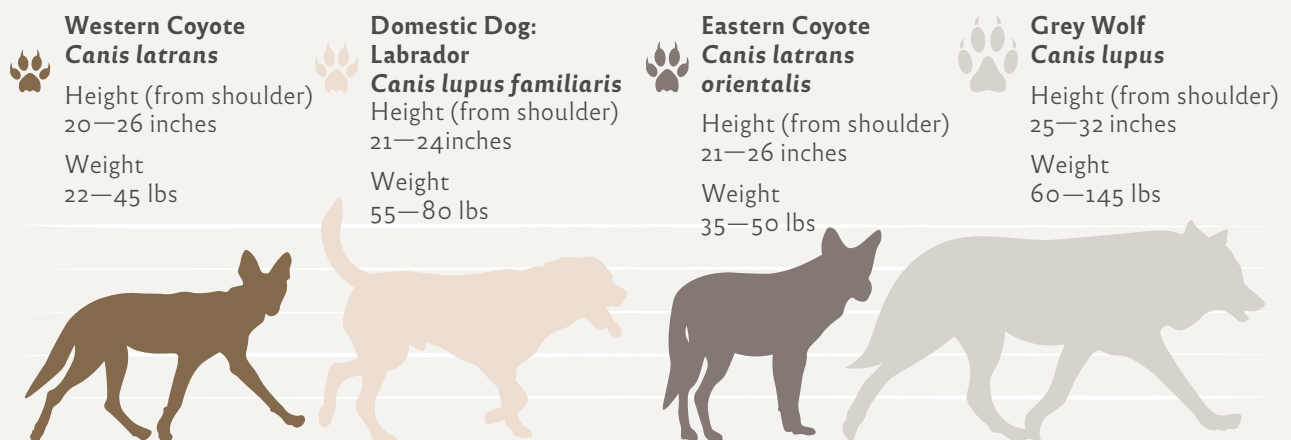
Coyotes (*Canis latrans*)

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BEHAVIOR

Coyotes are highly intelligent and social animals; they learn quickly and are devoted parents (Bekoff & Gese 2003). Their intelligence and sociability are integral to their well-being and behavioral flexibility, and through those physiological traits, to their ecological role. Coyotes' adaptability allows them to interact in a variety of ways and contexts with humans, sometimes in ways that evoke human concern and lethal retaliation (Alexander & Draper 2019). Yet such traits have allowed coyote populations to not only survive, but thrive and expand despite consistent past attempts at extermination and ongoing persecution.

In rural habitats, coyotes hunt by day and night. In urban areas, coyotes appear to be more nocturnal but can often be seen during daylight hours, especially at dawn and dusk (Bekoff & Gese 2003, Grubbs & Krausman 2019, Riley et al. 2003; see also Soccorsi et al. 2023). Those sightings, even in highly developed urban areas, are not by themselves cause for concern, and do not necessarily reflect increased coyote boldness or increases in the coyote population.

Coyotes communicate by vocalizing, scent marking, and body language. In rural and some suburban areas, it is common to hear them howling and yipping at night, or even during the day in response to sirens and other loud noises. Indeed, coyotes' scientific name is *Canis latrans*, which means "barking dog." With approximately a dozen different vocalizations, it is common to mistake a few coyotes communicating with each other for a large group due to their deployment of the 'beau geste effect', by which coyotes create the auditory illusion of being more numerous using a variety of sounds and pitches (Brewster et al. 2017).

Coyotes are also fast and agile; they can run at speeds of 25-40 mph (65 km/h) and some researchers report coyotes jumping over eight-foot fences. They are also very adept climbers.

COYOTES AND DOGS

Coyotes and dogs are related and can exhibit similar behaviors. However, curiosity and play are often misinterpreted as boldness or aggressiveness. Coyotes usually communicate using a wider range of vocalizations than dogs. In the presence of other canids and humans, coyotes generally vocalize to signal their presence and keep intruders away, without such vocalizations signaling intent to engage with intruders (see our resource on **Dogs & Coyotes**).

Coyotes (*Canis latrans*)

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SOCIAL STRUCTURE

Coyotes exhibit complex social structure, and may live as solitary individuals, in pairs, or in small family groups, both in rural and urban areas (Bekoff & Gese 2003). Coyotes are generally monogamous, with pair bonds frequently lasting many years, and some for life. Such monogamous behavior is evidence of their rich internal lives: they form strong bonds with their partners and raise their pups together, demonstrating loyalty and cooperation. Urban coyotes are especially known for high rates of monogamy, showing 100% dedication to their partners in some areas (Hennessy et al. 2012). Both male and female coyotes actively maintain territories that may vary in size from two to 30 square miles.

Reproduction is once per year and typically limited to the family's breeding pair (Bekoff & Gese 2003). Breeding season peaks in mid-February, followed by on average three to seven (3-7) pups born in a den from March to May (gestation lasts approximately 63 days) (Bekoff & Gese 2003, Carlson & Gese 2008). Pups typically emerge from the den by 3 weeks, are weaned at about 5-7 weeks, and follow adults to hunt or feed on carrion within 2 months (Bekoff & Gese 2003). Pup rearing season occurs during the spring and early summer months, usually from April to July. During this time, males concentrate their activities near dens, providing food and protection, while female coyotes will remain at a den site to provide nursing and protection for their very vulnerable pups, until the pups are able to travel short distances unaided (Harrison & Gilbert 1985, Way et al. 2004). Larger pack sizes contribute to den-guarding and pup provisioning (Crabtree & Sheldon 1999). Coyote pups also learn to hunt and develop dietary preferences during this period. Reducing the number of adult coyotes available for pup feeding could incentivize the remaining adults to target larger prey, including domesticated animals, and encourage their venturing closer to human activity in search of resources (Crabtree and Sheldon 1999, Mitchell et al. 2004). Research has also shown that human-coyote conflicts are more common during the pup-rearing period (Lajeunesse et al. 2023, Lukasik & Alexander 2011a, Wilkinson et al. 2023) given coyotes' focus on protecting pups from humans and their dogs.

Pup mortality is high, with an average of 50-70% dying within their first year. Some juveniles disperse in late fall to seek new territory (around 9-11 months), and some individuals remain with their parents/family group (Bekoff & Gese 2003). This marks the second season when a higher presence of coyotes may be noticed. It is common for people to get alarmed and incorrectly perceive this as a sudden increase in their population or coyotes exhibiting bold behavior. However, it is important to understand that younger coyotes are simply dispersing and exploring new territories and mates.

Coyotes (*Canis latrans*)

DISTRIBUTION AND HABITAT

Endemic to the Western two-thirds of North America, coyotes have greatly expanded their distribution across North and Central America (Hody & Kays 2018), aided by the extirpation of wolves, alteration and transformation of habitat, and urban sprawl (Fox 2006). Coyotes play an important ecological role helping to maintain resilient ecosystems and species diversity.

Coyotes are considered habitat generalists, which means they are capable of thriving in a wide array of land types, including agricultural, urban, and undeveloped areas, as well as various habitat covers such as woodlands, grasslands, and shrublands (Bekoff & Gese 2003). This remarkable adaptability

Coyotes (*Canis latrans*)

enables coyotes to successfully establish themselves in urban environments, where food and shelter resources are abundant. It is essential to note that their migration into urban areas is not a result of being driven out of their natural habitats or solely due to urban expansion encroaching upon less developed areas. Instead, coyotes have effectively transitioned into and acclimated to human-dominated ecosystems since pre-colonial times (Flores 2017), much like they have done in other North American environments, primarily due to the presence of suitable habitat, including access to food, water, shelter, and adequate space.

Studies indicate that urban-dwelling coyotes predominantly utilize natural areas and green spaces like parks, golf courses, and cemeteries as their primary habitats, and typically avoid areas of high human activity or development, although some may venture beyond green areas during dispersal or transient phases, when actively hunting, or if they are sick (Gehrt et al. 2009, Grinder & Krausman 2001, Grubbs & Krausman 2009, Lombardi et al. 2017, MacDougall & Sander 2022, Murray et al. 2015a, Riley et al. 2003, Way et al. 2004). Coyote home ranges also tend to increase in size with urban development since such areas are generally less suitable (Bekoff & Gese 2003, Gehrt et al. 2009, Lombardi et al. 2017, Ordeñana et al. 2010, Riley et al. 2003). This body of research suggests that, within the urban matrix, coyotes may have a tolerance threshold for urbanization: coyote densities seem to be higher relative to rural populations (but not substantially so) within urban habitat fragments, but lower within the developed urban matrix given the challenges related to acquiring resources associated with it (Crooks 2002, Crooks & Soulé 1999, Ordeñana et al. 2010, Tigas et al. 2003). Hence, coyotes tend to use low- and medium-density residential areas more than highly developed, high-density residential areas.

Coyotes (*Canis latrans*)

DIET

Coyotes are diet generalists, meaning they eat a wide variety of foods and, like most animals, prefer food that is easiest to obtain. They are true omnivores, and their diet may consist of rodents, rabbits, insects, lizards, snakes, vegetables, and fruits (Bekoff & Gese 2003, Gehrt & Riley 2010). They can prey on deer fawns when available, and in regions where they are larger (Eastern and Midwestern US), they can hunt adult deer. They will also take advantage of unsecured garbage and pet food left outdoors. Coyotes may resist trying new food sources unless stressed, such as in the case of losing adult providers or needing to feed a large litter. Urban coyotes primarily eat small rodents and berries, but their dependence on human food varies between cities (Gehrt & Riley 2010). Cultivated fruit is the most common type of human-provided food that coyotes eat in many urban areas (as reviewed by Gehrt & Riley 2010, Murray et al. 2015a). Coyotes' consumption of human-associated foods tends to increase with their use of developed relative to natural areas (Larson et al. 2020, Morey et al. 2007, Newsome et al. 2015). As scavengers, coyotes also provide an ecological 'maintenance' service by helping to keep our communities clean of carrion (i.e., roadkill).

In urban areas, coyotes have been known to take smaller pets if left unprotected (see section on **Coyote attractants** below). Animal guardians are advised to consider predation risk if allowing their cats outdoor access, and to keep dogs on leash or under reliable recall during the day and indoors at night (see **Coyotes and Humans** section below and our resource on **Dogs & Coyotes**).

Coyotes (*Canis latrans*)

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SARCOPTIC MANGE

Coyotes in urban areas are often afflicted by sarcoptic mange, a highly contagious skin disease, due to their higher concentrations near human communities, attracted by the abundant resources in these environments. Mange, caused by parasitic mites that burrow into the skin and lay eggs, results in severe itching, scabs, and hair loss, particularly around the face, ears, legs, and tail. This distressing condition often leads to secondary bacterial infections, worsening the symptoms. This makes it harder for them to keep warm and find food, and in severe cases, can lead to extreme weight loss and even death (Pence et al. 1983, Samuel et al. 2001). Notably, the mites responsible for coyote mange may cause short term skin irritations in humans but cannot complete their life cycle in human hosts, eliminating the risk of transmission, although they may potentially spread to dogs. Mange can become life-threatening for coyotes when they ingest poisoned rodents, as the toxins from rodenticides continue to harm their immune systems even after the rodent's death (Poessel et al. 2015).

Research evaluating the impact of mange on coyote movements and use of anthropogenic resources in urban environments found sick coyotes tended to stay in more developed areas, had larger monthly home ranges, were more active during the day, consumed less protein compared to healthy coyotes, and were more likely to be involved in conflicts (Gehrt et al. 2009, Murray et al. 2015a,b). Human-provided food, though not very nutritious, is easy for sick coyotes to find and more consistently available throughout the year. This might make them more dependent on these human-associated foods, increasing their interactions with people.

Coyotes (*Canis latrans*)

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Coyotes severely affected by mange exhibit listlessness, reduced aggressiveness, and a reduced natural fear of humans. This underscores the importance of environmentally responsible and humane practices when coexisting with urban wildlife. Effective treatment and management of mange in coyote populations is crucial for their overall health and well-being, as well as for mitigating negative interactions. While some coyotes may naturally resist mite infestations, those with weakened immune systems are at risk of succumbing to secondary diseases, leading to a slow and painful decline in health, especially during harsh winter conditions. It is vital to recognize that mange is a treatable condition, and wildlife rehabilitation or humane practices can significantly alleviate suffering and support the social and numerical stability of the local coyote population. We urge any individuals interested in mange treatment for wild coyotes to confer with their local wildlife rehabilitation facility(ies), animal control officers, and humane societies to discuss potential treatment options.

Public administrators and wildlife professionals should focus on reducing disease prevalence and avoid relying on disease to control wildlife populations (Murray et al. 2015b). One way to reduce the need for lethal management is by identifying and securing overly abundant but low-quality human food waste. Another important way for public administrators to contribute to coexistence and coyote well-being is to prohibit the use of rodenticides, which are linked to increased risk of diseases and mortality in coyotes and other urban predator species (Elliot et al. 2014, Gehrt & Riley 2010, Poessel et al. 2015). Additionally, public information campaigns should underscore the need for accurate information and compassionate responses to coyotes with mange (and other diseases). By educating the public and creating by-laws, we can limit coyotes' access to foods associated with lower coyote well-being, increased coyote mortality, and conflicts.

Coyotes (*Canis latrans*)

WHY COYOTES Coyotes have inherent value regardless of our perception of them, but here are a few ways we benefit from having them around. These are collectively referred to as ecosystem services.

Coyotes help maintain a clean environment. By feeding on carcasses, coyotes play a crucial role in reducing waste and preventing the spread of disease in ecosystems.

Coyotes may help reduce the spread of zoonotic diseases such as Lyme disease by preying on rodents and small mammals that host disease-carrying ticks.

Coyotes promote biodiversity. By controlling mesocarnivore populations, coyotes positively impact the diversity and abundance of song and ground nesting bird populations.

Coyotes help control rodent and rabbit populations in both rural and urban communities. By preying on rodents and rabbits, coyotes reduce their numbers, limiting potential agricultural damage and improving environmental health.

Coyote packs are families. Coyotes are generally monogamous and form lasting pair bonds. Dominate breeding pairs form multigenerational family groups (aka packs) and behaviorally suppress breeding by other group members. These self-regulating behaviors prevent coyotes from over-populating their habitats and promote increased biodiversity and ecosystem health.

ECOLOGICAL ROLE

Adaptable to diverse environments, coyotes provide the following ecological benefits:

Studies indicate that coyotes limit other mesocarnivore (e.g., foxes, feral cats) populations largely through competitive exclusion (but also predation, in the case of cats), thereby having a positive impact on biodiversity, including ground-nesting birds and songbird diversity and abundance (Avrin et al. 2023, Crooks and Soule 1999, Gehrt et al. 2013, Henke & Bryant 1999, Kays et al. 2015, Mowry & Wilson, 2019).

Coyotes keep rodent and rabbit populations in check. Rodents and lagomorphs (rabbits and hares) are important prey for coyotes, often making up more than half of the dry weight of prey items found in scats (Fedriani et al. 2001, Morey et al. 2007). However, this percentage varies regionally, seasonally, and by level of urbanization – all of which affect the availability of rodents and lagomorphs as prey. Laundré and Hernandez (2003) estimated 162 – 192 lagomorphs or 3110 – 3681 rodents per year per coyote are needed to fulfill metabolic needs (more

Coyotes (*Canis latrans*)

Jan Jacob #CaptureCoexistence

if breeding/lactation was accounted for) for coyotes in the Great Basin Desert – making lagomorphs a better energy return on hunting investment. Thus, coyotes provide benefits to both urban and rural communities by regulating rodent and lagomorph populations. City dwellers may enjoy environments with lower rodent populations which could potentially help in avoiding the use of rodenticides that can impact non-target animals. Ranchers benefit from coyotes controlling micro-herbivores (such as rabbits and gophers) that otherwise compete with their grazing animals for food. Farmers may also suffer less crop loss or damage when coyotes naturally control rodent populations.

Coyotes may also help control disease transmission through their predation on rodents, which can be an important prey item across the urban development gradient (Morey et al. 2007, Newsome et al. 2015). Although studies have yet to explore this question directly for coyotes, evidence from other rodent predators like foxes, also present in urban landscapes, notes the latter may contribute to reducing the spread of rodent-borne zoonotic diseases such as Lyme disease (O'Bryan et al. 2018). Increased rodent populations are directly correlated with increased disease transmission risk (Krawczyk at al. 2020). Therefore, healthy and abundant rodent-consuming predator populations such as coyotes have a strong potential to protect human health by effectively regulating rodent numbers at low levels (Ostfeld & Keesing 2000). Also, by controlling mesopredator populations, coyotes can limit tick-borne disease transmission.

As a species that also scavenges, coyotes provide an ecological service by helping to remove carrion (dead animals) from the landscape (Prugh 2005).

Coyotes (*Canis latrans*)

COYOTE POPULATION IN [STATE/LOCALITY]

[INSERT CITY/COMMUNITY COYOTE DATE/INFO HERE]

Coexistence Strategies

Coexistence Strategies

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HUMAN-COYOTE INTERACTION AND COEXISTENCE DEFINITIONS

Using a common set of terms is essential for effectively conveying the objectives and information within this Model Coyote Coexistence Plan. In this document, we will rely on specific terms that are defined as follows:

Coexistence – sharing the landscape while mitigating negative interactions, promoting positive ones, and allowing for the well-being of coyotes, humans and domesticated animals. People take an active role in keeping coyotes in their community wild and wary through "holistic education" (see **Public education and outreach** section), learning about coyote well-being, ecology and behavior, removing attractants, providing adequate natural habitat, taking responsibility for domestic animal safety, and hazing coyotes in neighborhood or community spaces (except for predetermined coyote-appropriate areas) when necessary.

Attractants – resources that may lure or encourage coyotes to frequent particular areas. Urban residential landscapes offer an abundance of food, water, and shelter (attractants) for coyotes (see **Coyote attractants in (sub)urban areas** section).

Habituation – a process where coyotes become less wary of humans over time because they are incentivized to associate the latter with attractants. While coyotes usually avoid humans, coyotes can become habituated when they are increasingly rewarded for engaging with humans. Habituated coyotes are more likely to have negative interactions with humans (and pets) than non-habituated ones. To prevent urban coyote habituation, we must understand what attracts them to a human-dominated environment.

Sign detection – The act of noticing signs of a coyote, such as tracks, scat, or vocalizations, but without visual observation of the coyote(s).

Sighting – A visual observation of a coyote(s) at any time.

Coexistence Strategies

Sarah Killingsworth #CaptureCoexistence

Nicole Wilde #CaptureCoexistence

Encounter – A chance meeting between a human and a coyote(s) without physical contact or aggressive behavior from the coyote(s).

Conflict – Occurs when an action by humans (and their pets) or wildlife has an adverse impact on the well-being of the other.

Incident – An incident between a person and a coyote occurs when the coyote displays behavior perceived as aggressive (i.e. agonistic) such as baring teeth, lunging, or making physical contact with the person or pet. The person or pet is not bitten.

Human Attack – A human is bitten by a coyote(s).

1. Provoked – An attack where the involved person, intentionally or not, motivates the coyote to engage, such as: hand-feeding a coyote, approaching a coyote den or an adult with pups, or intervening in a coyote attack on a pet.

2. Unprovoked – An attack where the involved person does not motivate the coyote to engage.

Pet Attack – A coyote(s) kills or injures a pet.

1. Attended – Pet is on a leash less than six feet in length or is in the presence of a person less than six feet away and is attacked and injured/killed by a coyote.

2. Unattended – Pet is attacked and injured/killed while unsupervised in a yard, free-roaming, walking off-leash more than six feet from their guardian, or on a leash longer than six feet (e.g., flexi-leash, long lead).

Domesticated animal predation – Coyote(s) kills/injures a domesticated animal with productive value (e.g., chicken, lambs).

Coexistence Strategies

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COYOTES AND HUMANS

When coyotes live close to human populations, conflicts — often driven by fears of predation on domesticated animals — may arise, and most conflicts result in de-facto killing of coyotes (Fox 2006, Fox and Papouchis 2005). However, despite decades of poisoning, trapping, and shooting, coyotes persist and conflicts with people continue. Two hundred years of costly persecution have not eliminated the resilient coyotes, but instead have raised significant animal well-being concerns and failed to reduce conflicts (Alexander 2015).

Claims that coyotes threaten humans and domesticated animals are greatly exaggerated. A study of coyote attacks on humans over a 38-year period (1977-2015) found only 367 documented attacks by non-rabid coyotes in Canada and the U.S., only two of which resulted in death (Baker & Timm 2017). In comparison, there are more than 4.5 million dog bites annually in the U.S., >800,000 of which require medical attention (Gilchrist et al. 2008) and dozens resulting in death (CDC 2023). The incidence of rabies in coyotes is relatively low. In 2021, a study reported only 9 cases of rabies in coyotes nationwide, compared to 1,031 cases in raccoons and 691 cases in skunks (Ma et al. 2023). Rabies in coyotes is associated with increased aggression (Wang et al. 2020).

Conflicts generally occur due to coyotes' attraction to resources associated with humans ('attractants'). Coyote habituation results from prolonged exposure to situations in which interacting with humans has proved beneficial in securing a resource, making them less wary, particularly when food is involved. Habituated coyotes may pose a higher risk of negative interactions with humans. To mitigate habituation in urban areas, it is crucial to identify the specific human-related factors that attract coyotes (Mowry et al. 2021).

Coexistence Strategies
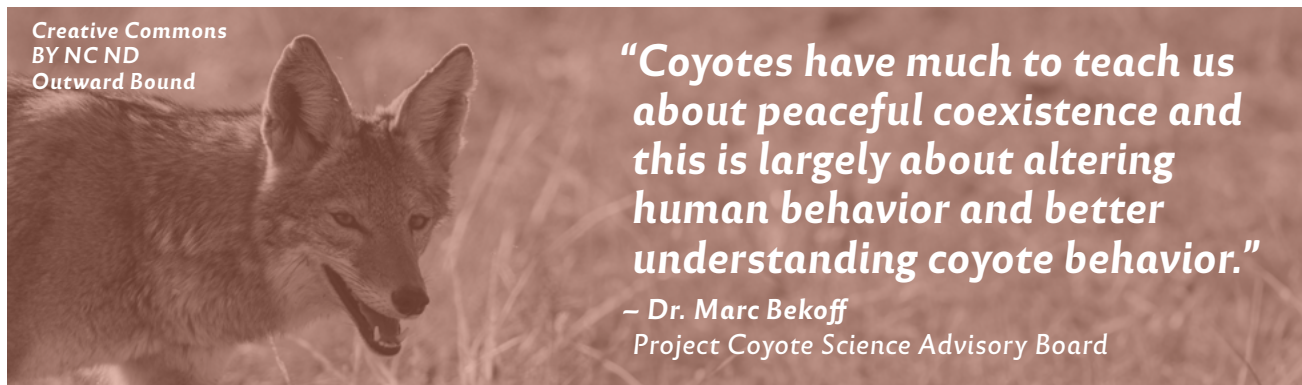

Trevor Clark (Shutterstock)

COYOTE ATTRACTANTS IN URBAN AREAS

Shelter – Urban coyotes predominantly inhabit green spaces, yet buildings, sheds, decks, and landscaping can serve as covert shelter, enabling them to inconspicuously live near humans. During the spring, when coyotes are raising their young, they often concentrate their daily activities around dens or burrows, which can include spaces beneath sheds or decks. This proximity increases the potential for encounters between coyotes, people, and companion animals.

Water – While coyotes can meet a significant portion of their hydration needs through their diet, they also readily use accessible water sources. Urban environments offer a constant supply of water throughout the year, thanks to natural streams, human-made landscape features like ponds, and other private water sources, like bird baths and pet water containers. Moreover, with increasing climate change, both increased droughts and fires may drive wildlife into urban communities – which should inspire coexistence rather than attempts to exclude them. Although natural and human-made water sources contribute to the overall availability of water for both urban coyotes and other wildlife, especially during periods of drought, removing private water sources like pet water containers is essential for mitigating negative interactions.

Coexistence Strategies

"Coyotes have much to teach us about peaceful coexistence and this is largely about altering human behavior and better understanding coyote behavior."

– Dr. Marc Bekoff
Project Coyote Science Advisory Board

Food – Whether through direct or indirect means, humans provide access to food for both coyotes and some of their prey species, such as rodents and rabbits. Abundant food resources in urban environments, including pet food, bird feeders, fruit trees, compost piles, and gardens, draw coyotes to these areas and reduce their territory sizes, resulting in higher pack densities (Mitchell et al. in prep). Both deliberate (directly feeding coyotes) and inadvertent (making food resources accessible) actions can encourage coyotes' association of humans with food sources, potentially leading to problematic interactions involving coyotes, humans, and domestic animals (Baker & Timm 2017, Timm & Baker 2007, White & Gehrt 2009). In their review of coyote attacks on humans, White and Gehrt (2009) found that in a third of reported incidents coyotes were either intentionally or accidentally being fed by residents near the site of the attack.

- **Domesticated animals** – Although coyotes are known to prey on calves and sheep, the U.S. Department of Agriculture (USDA) data shows their predation to be minimal. In 2015, less than 0.30% of the U.S. cows and sheep inventories (including calves and lambs) were lost to all carnivores combined—including coyotes, wolves, cougars, bears, vultures, dogs, and unknown carnivores. The predominant sources of mortality to cows and sheep, by far, are non-predator causes including disease, illness, birthing problems, and weather (USDA 2015a,b). Coyotes may also prey on other, smaller domesticated animals kept outdoors in urban backyards, such as chickens or rabbits. **Non-lethal measures** such as protective fencing (e.g., predator proof chicken coops and goat pens) and guardian animals (e.g., guardian dogs, donkeys, llamas) can prevent such conflicts (Shivik 2014, Shivik et al. 2003, Treves et al. 2016).

- **Companion animals** – Although most coyotes do not prey on companion animals (Sacks et al. 1999a, 1999b), small, unsupervised companion animals may be considered prey (an attractant) and therefore are at risk of predation, even inside private yards. Studies show the presence of companion animals in coyote scat to be minimal in most areas (<2%; Lukasik & Alexander 2012, Poessel et al. 2017a). However, a study in southern California documented domestic cats as accounting for a higher proportion of coyote diets (approximately 20% in the Los Angeles area), although the reason for this substantially higher figure relative to other areas remains unclear (Larson et al. 2020).

Coexistence Strategies

- **Cats** – Coyotes primarily prey on small mammals like rodents, but also larger ones such as rabbits and groundhogs. In certain situations, free-roaming outdoor cats, which are approximately the same size as groundhogs or rabbits, may be considered potential prey by coyotes (Grubbs & Krausman 2009, Larson et al. 2020, Morey et al., 2007). Moreover, coyotes have been found to impact cat abundance, distribution and ecological impact in some contexts (Crooks & Soulé 1999, Davenport et al. 2022, Gehrt et al. 2013, Kays et al. 2015, 2020). It is critical to understand that coyote attacks on cats are natural behaviors and do not signify a threat to humans. The only fail-proof approach to protect cats from coyotes is to either keep them indoors, provide them outdoor time in a secure enclosure (**catio**), or allow them outside while accompanied by a person on a leash and harness. Guardians who allow their cats to roam outdoors can mitigate risk of predation by avoiding times when coyotes are most active (dawn, dusk, nighttime). Importantly, guardians that allow their cats to roam outdoors should recognize and take ownership of such predation risk (alongside others such as car collisions and negative encounters with other animals), instead of blaming coyotes for such conflicts and requesting their removal.

- **Feral cats** - Individuals who provide food and care for feral cats often have concerns about the potential for coyote predation on these cats. Coyotes are indeed drawn to outdoor pet food sources and also view cats as prey. While all outdoor cats (feral or not) are at risk of predation, there are effective strategies to enhance the safety of feral cat colonies, as demonstrated by a study in the Eastern US (Mitchell et al. 2022). These methods not only reduce coyote predation on feral cats but also minimize conflicts involving coyotes in neighboring areas.

    - **Adjust feeding practices:** Provide food only during the day, at a set time, and offer an amount that the cats can consume within a short timeframe, removing any leftovers immediately. You can also provide escape routes for cats, and haze any coyotes in the area to discourage their approach (see **Hazing techniques** below). Mitchell et al. (2022) found that cats quickly adapt to these practices and find enough food without experiencing distress or weight loss.

    - **Install elevated feeding stations:** Construct feeding stations that allow cats to access food while keeping coyotes and other wildlife at bay (see Mitchell et al. 2022). Smaller, adjacent platforms can be created to assist older cats, ensuring they have to jump to reach the main platform. Attaching an aluminum sheeting apron at the platform's base prevents raccoons and opossums from gaining access to the feeding station.

  Implementing practical strategies like these can significantly enhance the safety of feral cat colonies and reduce conflicts.

Coexistence Strategies

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- **Dogs** – Coyotes may occasionally perceive domestic dogs as competitors or threats, leading to rare attacks in urban areas which research suggests are typically territorial rather than predatory (Alexander and Quinn 2011). Studies have found most common urban conflicts are dog-related (Mowry et al. 2021, Poessel et al. 2017a, Wilkinson et al. 2023), and a substantial proportion of people reporting conflict or encounters ignore leash laws (Wilkinson et al. 2023). Small, unattended dogs are more likely to be seen as potential prey, so it is essential to keep them on a leash shorter than six feet or stay within that distance from them when outside to prevent any misinterpretation by coyotes. You should also pick up your small dog if you see a coyote. Attacks on larger dogs, while rarer, can occur during the coyote breeding season (January to March), and during pup rearing season (April to August, see Wilkinson et al. 2023) making it crucial to supervise and leash dogs in public areas during this period. It is also important to minimize walking your dog near brushy areas or edge zones, which coyotes may use for shelter, and during dawn and dusk, when coyotes are most active. You can also purchase a variety of protective vests for your dog, which come equipped with spikes, bristles or lights to deter attacks and injuries.

For more information about reducing conflicts between dogs and coyotes see **Project Coyote's Dogs & Coyotes fact sheet**.

Coexistence Strategies

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MONITORING AND DATA COLLECTION

In most urban areas, the presence of coyotes often goes unnoticed until a conflict arises. Establishing a proactive monitoring system is crucial for public administrators, wildlife officials, and residents to track coyotes' activity before conflicts arise. Online platforms can be customized for citizens to report coyote sightings and encounters, enabling wildlife officials and researchers to gather valuable information on coyotes' movements and behavior within specific areas.

Effective coexistence with coyotes relies on monitoring and data collection. Engaging both residents and city officials through a coyote hotline or online reporting form helps document human-coyote interactions, track coyote sightings, and identify conflict-prone areas (White & Gehrt 2009, Wilkinson et al. 2023). Such a citizen-based monitoring platform actively involves residents in coyote management and recognizes their contributions to coexistence. It can collect data on coyote observations, including location, and include behavioral questions to assess coyote habituation levels. These data help identify areas of concentrated coyote activity ("hot-spots"), allowing for targeted public education and outreach efforts to address behavioral issues (e.g., eliminating food attractants, assuring pets are adequately supervised, or hazing). Monitoring and reporting also enables public administrators to implement targeted research, educational campaigns, and conflict mitigation efforts, along with the ability to measure long-term success in reducing conflicts.

Coexistence Strategies

Matt Knoth (Shutterstock)

To ensure consistency in reporting encounters or incidents with coyotes, city administrators should make a standardized Coyote Encounter/Incident Report Form (see **Appendix A**) readily available to residents and employees. The form should include contact details of the individuals reporting the incident, such as name, address, contact information (e.g., phone number or email), as well as specific incident information.

To help public administrators address the monitoring portion of the coexistence plan, Project Coyote has developed a reporting app titled "Wildlife Interaction Report". The app allows the public to virtually submit reports on encounters and interactions with coyotes. The records are connected to a live data visualization platform where people can see and understand the data gathered more effectively. Moreover, there are many ongoing municipal-level monitoring efforts that could be integrated with this resource for more efficient data collection and visualization. Virtual science networks such as **iNaturalist** can also encourage people to record their encounters, cultivating appreciation for nature and creating a sense of community.

If conflicts persist in certain areas, administrators and wildlife managers may implement non-invasive monitoring and identification methods (e.g., camera traps or genetic sampling) or a trapping and collaring/tagging program to monitor and address specific issues, individuals or areas. Like many other practices, collaring may be harmful to individual coyotes and their social groups, requiring strict scrutiny of its ethical and scientific justification. Such monitoring enables the identification of individual coyotes and helps determine the root cause of conflicts and how to mitigate them.

Coexistence Strategies

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Camilla Fox #CaptureCoexistence

PUBLIC EDUCATION AND OUTREACH

Proactive education plays a pivotal role in fostering peaceful coexistence with coyotes. The effectiveness of coyote coexistence education and outreach lies in its community-oriented approach. When people are informed, they realize that by collectively modifying some everyday habits and behaviors, they can positively influence coyote behavior. Management of human behavior and practices is the primary and most effective way to mitigate negative interactions with coyotes. This shift in approach is the key to achieving long-term coexistence. As coyotes are here to stay, ineffective and costly lethal control methods should be replaced with effective and humane coexistence-based solutions.

Educational efforts directed at managing human behavior should focus on reducing wildlife attractants, promoting deterrents and effective hazing methods, enhancing pet safety, promoting an understanding of coyotes, their intrinsic value and their ecology, setting realistic expectations for their behavior, proactive monitoring, and guiding residents on appropriate responses to coyotes and other urban wildlife. It is important to establish a shared vocabulary to distinguish normal from abnormal coyote behavior in discussions about encounters (see **Human-coyote interactions definitions** section above).
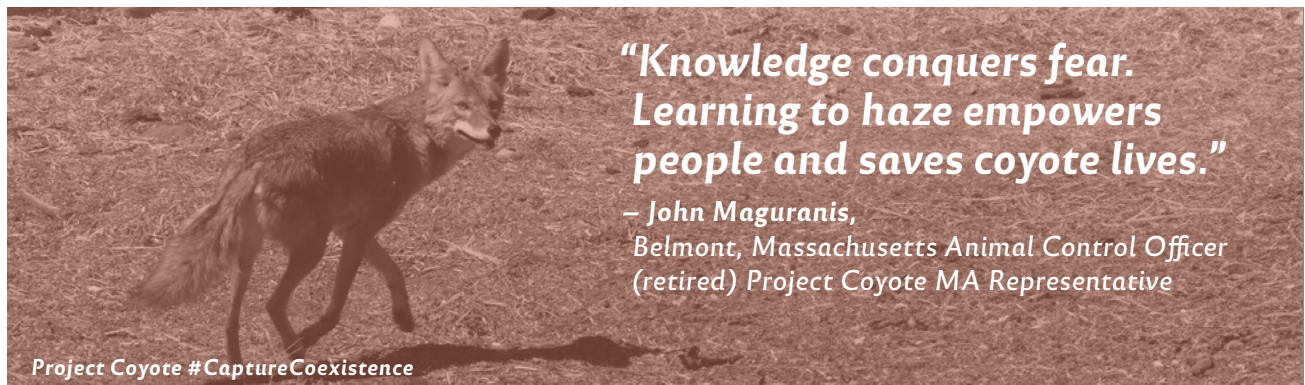
Coexistence Strategies
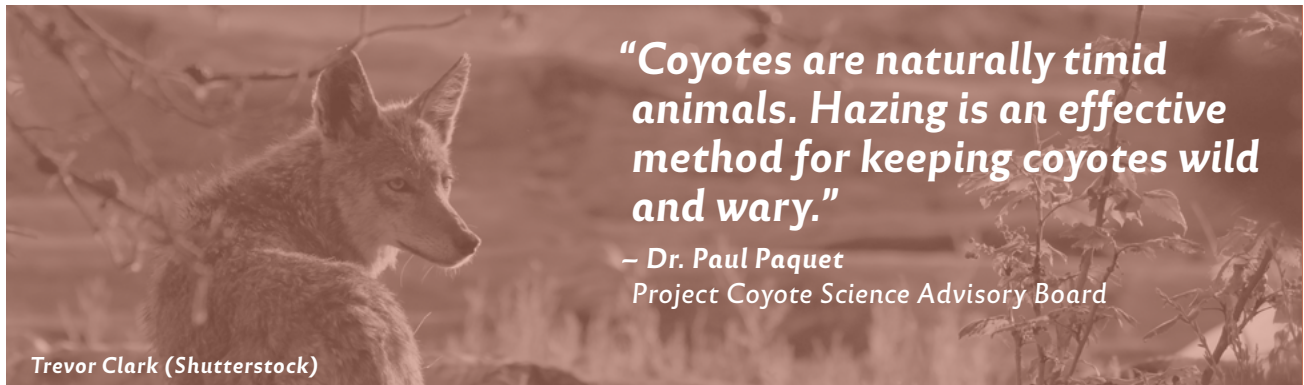
"Coyotes are naturally timid animals. Hazing is an effective method for keeping coyotes wild and wary."
— *Dr. Paul Paquet*
Project Coyote Science Advisory Board

Trevor Clark (Shutterstock)

Additionally, affect also plays a significant role in (perceptions of) interactions with wildlife. 'Affect' refers to positive or negative emotional connections with wildlife (Drake et al., 2020). How we feel about animals, like coyotes, influences our attitudes and actions. Emotions, like fear or affection, often guide our decisions more than careful thinking, especially when we do not encounter these animals often. In one example from Chicago, as people became more worried about potential risks from coyotes, their support for using lethal methods to manage them increased (Sponarski, Miller, & Vaske, 2018). Previous studies indicate that scientific understanding is more significant in situations where emotions and beliefs are not a factor (Stevenson et al. 2015). A multi-city survey study in North Carolina exploring how multiple factors affected perceptions of coyotes found that "affectual connection to coyotes had the greatest effect on predicting [the perceptions of people about coyotes]" and suggested efforts to promote positive emotional connections to wildlife to increase their acceptance (Drake et al. 2020). Such emotional connections can be promoted through holistic education that acknowledges and promotes wild animals' intrinsic value, sentience, autonomy, agency, self-awareness and sociality, and provides ethical guidelines that promote compassion and respect towards them. Merely imparting biological facts to individuals may not be successful unless accompanied by efforts to improve their perceptions of wild animals and their relationship towards them (Drake et al., 2020, Nardi et al. 2020). Therefore, education and outreach should always include a robust ethical component that promotes the shared lived experiences and conditions between humans and wild animals, such as: sentience and self-awareness, valuing their own lives and wanting to continue living with sustaining resources in a safe home, having agency, self-determination, valued family and social relationships, and being vulnerable to prejudices and harms. Importantly, holistic education should promote thinking of urban areas as spaces where wild animals should be welcome as residents, rather than thinking of such areas as spaces reserved for humans where wild animals are considered intruders.

Coexistence Strategies

"Knowledge conquers fear. Learning to haze empowers people and saves coyote lives."

— John Maguranis,
Belmont, Massachusetts Animal Control Officer
(retired) Project Coyote MA Representative

Project Coyote #CaptureCoexistence

A successful educational campaign should focus on residents' ability to coexist harmoniously with coyotes (and other urban wildlife). This can be achieved through various means, such as social media, brochures, informational postcards and signage, incorporating coyote education into school curricula, organizing seminars and training for wildlife officers and the public, and establishing an outreach and education team comprising wildlife officers and trained community volunteers, especially in under-resourced communities that lack wildlife officers or police with wildlife training. Volunteer teams can engage in community outreach, attend local events, conduct classroom presentations, and offer direct support to individuals and neighborhoods with concerns.

Signage about coyote behavior, presence, reporting, and proper human response(s) is a crucial component of an educational campaign and should be deployed proactively in areas with known coyote presence. Such signage should be multilingual and easily accessible (e.g. using a QR code). Signs should be placed citywide, not just in major public green spaces where coyotes are known to den (Wilkinson et al. 2023), with close attention to conflict hotspots identified through monitoring and reporting efforts, and their particular educational needs. For example, locations reporting more conflicts with dogs may require educational efforts targeted at how dog owners can prevent conflicts, while higher density areas reporting seeing more coyotes during daylight hours may require messaging focused on correcting misperceptions about coyotes becoming bolder or more numerous, and how to respond to encounters.

Educational campaigns should be disseminated through multiple channels, including print, virtual, and social media, and ideally in collaboration with advocacy organizations like Project Coyote, professional organizations such as the National Animal Care and Control Association (NACA), and agencies such as the National Park Service (NPS) that specialize in coyote-human conflict resolution.

Project Coyote has compiled a number of free resources that can be downloaded and distributed to help make your community wildlife aware (see **projectcoyote. org/resources/**). Contact us if you would like to use any of these resources for your outreach efforts (**agency logos at bottom can be tailored to your needs**). Project Coyote offers the artwork for free as part of our ongoing effort to help expand community educational outreach efforts and promote coexistence.

Coexistence Strategies

NON-LETHAL INTERVENTIONS

Prevention—not lethal control—is the best method for minimizing conflicts with coyotes in urban (and rural) settings. Many studies provide evidence that practicing good animal guardianship and using strategic, nonlethal interventions to protect domesticated animals (such as supervising them outdoors and fencing), removing attractants (like water bowls and pet food) and aversive conditioning (see 'hazing' below) are more effective than lethal control at preventing conflicts (Treves et al. 2016, Sampson & Van Patter 2020, Shivik 2014, Shivik et al. 2003, VerCauteren et al. 2003).

REDUCING ATTRACTANTS AND PRESERVING HABITAT

Urban and rural residential landscapes offer an abundance of attractants (food, water, and shelter) for coyotes. In these environments, a combination of providing coyotes with adequate habitat (including natural habitat fragments with water, food and shelter) and removing attractants from residences, or adequately securing them (see our **Yard Audit Checklist**) may decrease conflicts with humans and domesticated animals (Poessel et al. 2017b).

There are a variety of ways public administrators can reduce attractants in public spaces. To mitigate negative interactions and protect coyotes, humans, and pets, public administrators can reduce shelter around public areas by thinning vegetation in places where coyote dens would be problematic (e.g., dog parks, high-traffic trails, residential buildings) (Wilkinson et al. 2023) and securing other problematic den sites (e.g., under public structures). Public administrators can encourage reductions in the availability of human-associated foods through, e.g., securing garbage containers, dumpsters and compost waste (and ensuring garbage is removed before overflowing). This measure seems particularly important in densely populated urban areas, since there is a higher availability of such sources. Public education and outreach (see above section) through various mediums is a key component of promoting social norms against littering to promote coyote well-being and conflict mitigation. Human-associated foods are not part of natural coyote diets, and are associated with lower health outcomes, including increased risk of diseases (Murray et al. 2015a,b, see also Murray et al. 2016).

To prevent conflict during the denning season, administrators could cordon off certain areas (e.g., within green spaces, trails, parks, golf courses) where coyotes are denning, and keep such signs and cordoned areas up throughout the pup rearing season, as done by the city of San Francisco. Dissuading people from entering those areas gives coyote parents a chance to raise their young during this critical time and raises public awareness that this is the coyotes' home too. Public administrators can also promote coyotes' use of natural habitat by preserving such areas and increasing their connectivity throughout the urban landscape, such as through urban wildlife corridors (Crooks 2002, Crooks & Soulé 1999, Ordeñana et al. 2010, Tigas et al. 2003), especially along natural water sources like streams and rivers (see Grubbs & Krausman 2019).

Coexistence Strategies

As for private homes, residents should be encouraged to take the following steps to prevent coyotes from being attracted to their homes (**See Yard Audit Checklist**):

- Use wildlife-proof sturdy garbage containers with tight fitting lids.
- Don't leave pet food outside.
- Take out trash the same morning pick up is scheduled.
- Keep compost in secure containers.
- Keep fallen fruit off the ground. Coyotes eat fruit.
- Keep bird seed off the ground; seeds attract rodents which then attract coyotes. Remove feeders if coyotes are seen in your yard.
- Keep barbecue grills clean.
- Supervise your pet when you allow them out to your yard, especially if they are small – they may be considered prey (an attractant) and are therefore at risk of predation.
- Eliminate accessible water sources.
- Clear away brush and dense weeds near buildings. This action will also increase your home's defensible space if you live in an area where wildfires can occur.
- Close off crawl spaces under decks and around buildings where coyotes may den.
- Make loud noises with pots, pans, or air horns, or haze the coyote with a water hose if you frequently see a coyote in your yard.
- Share this list with your neighbors; coexistence is a neighborhood effort.

FENCING

If you can't eliminate all attractants or want extra protection (e.g., for your pets), fencing is a good option. Coyotes don't leap over fences in one bound; they grip with their front paws and kick up with their back legs. They can also dig under fences. To safeguard residential yards from coyotes, "coyote-proof" fences can be installed, which should be six to eight feet tall, constructed from a material and in a manner coyotes cannot climb, and, importantly, include outward-facing overhangs. Alternatively, a similarly tall fence with a protective device on top, such as a "**coyote roller**," can be used to deter climbing. Preventing digging under the fence can be achieved by extending the fence underground at least twelve inches or attaching an L-shaped mesh apron that extends outward at least 18 inches, securely fastened with landscape staples. These measures can help protect both pets and local wildlife while ensuring harmonious coexistence.

In lower income communities, the costs associated with these landscape investments may be prohibitive. To mitigate this situation, public administrators could develop a grant program to help lower-income residents implement these solutions.

Discover additional coyote coexistence methods by visiting **projectcoyote.org**.

Coexistence Strategies

HAZING TECHNIQUES

Coyotes, by nature, are reclusive animals that typically avoid human contact. However, in urban areas, coyotes may become accustomed to finding attractants in neighborhoods and subsequently lose their natural wariness of humans. To coexist safely, we must change our attitudes and actions toward coyotes in our communities. In addition to the critical monitoring and education efforts mentioned above, effectively reducing conflicts with coyotes involves implementing a Community-Based Hazing program (as detailed in **Appendix C**).

Hazing comprises activities aimed at modifying coyote behavior (Bonnell & Breck 2017, Breck et al. 2017, White & Delaup 2012, Young et al. 2019). Although often used interchangeably with aversive conditioning, hazing involves the immediate use of negative stimuli to change an undesirable behavior, while aversive conditioning is a learning process where negative stimuli are repeatedly applied over time to reduce the frequency of unwanted behavior (see Lajeunesse et al. 2023). In other words, consider hazing a specific activity that, when applied consistently, can contribute to an aversive conditioning program. Humane hazing techniques include making loud noises, spraying water, and shouting. This can help maintain coyotes' natural aversion to humans and may keep them away from areas in which they can cause conflicts.

The ***goals of establishing hazing protocols within communities*** are as follows:

- Discouraging problematic behaviors in coyotes and ensuring their continued aversion to humans.
- Preventing coyotes from entering public areas when people are present.
- Deterring coyotes from approaching people and pets.
- Empowering residents to handle coyote encounters and raising awareness about coyote behavior.

Hazing empowers residents by increasing their capacity to manage interactions with coyotes (Adams 2014), with measurable changes in knowledge and attitudes (Bonnell & Breck 2017). Hazing is also broadly accepted, although fewer people seem willing to practice it (DonCarlos 2013). Breck et al. (2017) found community-level hazing of urban coyotes to be an effective short-term tool for creating a safety buffer during encounters. In over 70% of attempts, coyotes moved more than 10 feet away. Residents can use voice, noise, body movements, and approach to haze coyotes without needing specialized tools (Bonnell & Breck 2017).

Coexistence Strategies

Project Coyote #CaptureCoexistence

Hazing problematic individuals can provide short-term benefits, helping people avoid conflicts (Bonnell & Breck 2017). Young et al. (2019) found that the number of times a coyote approached an adult or child decreased over days with repeated hazing, suggesting that coyotes learn to avoid behaviors that lead to hazing. This indicates hazing can be an effective non-lethal management tool. However, the coyote's prior experience, such as being hand-fed, and whether the interaction is with an adult or child can influence hazing outcomes (e.g., because the size or behavior of children may make them appear less threatening), affecting the efficacy of hazing programs (Young et al. 2019). Moreover, research on hazing's effectiveness for addressing long-term behavior (i.e., habituation) is inconclusive, with some research suggesting effectiveness (White & Delaup 2012) and others cautioning against its reliance for such purposes (Breck et al. 2017, but see study for limitations). Ideally, non-lethal methods should prevent the development of problem behaviors rather than correct existing ones (Breck et al. 2017). Hazing does not seem to impact coyote distribution (Bonnell & Breck 2017, Breck et al. 2017).

'SMART' hazing techniques include: **S**top and stand your ground; **M**ake yourself look big; **A**nnounce yourself in a strong voice; **R**epeat and reinforce if necessary; and **T**each others how and when to haze (Bonnell & Breck 2017). Proper hazing techniques should be modeled by experienced individuals (i.e., staff, volunteers, and citizen scientists) during site visits (Bonnell & Breck 2017, Worcester & Boelens 2007).

Coexistence Strategies

'SMART' HAZING

Coyotes are generally naturally reclusive and avoid people. However, in urban environments coyotes may lose their wariness if they become accustomed to finding attractants in neighborhoods (especially if fed, intentionally or not) and become habituated. Hazing empowers residents to manage interactions with coyotes and helps restore their natural fear of humans.

S
Stop. Stand your ground. Make and maintain eye contact. If you have a small dog, pick them up. Allow room for the coyote(s) to escape.

M
Make yourself look big. Exaggerate your presence. Raise your arms above your head. Wave your jacket. Persist until the coyote leaves.

A
Alert the coyote and other people in the area by yelling 'GO AWAY COYOTE!' This will dissuade the coyote from approaching. Make lots of noise / use noisemakers.

R
Repeat and reinforce. Coyotes can learn to avoid people. A coyote will change his/her behavior to avoid human contact the more often he/she encounters hazing techniques.

T
Teach others how and when to haze. A coyote who has negative experiences with different people, will learn to avoid human contact.

Coexistence Strategies

Aaron J Hill (Shutterstock)

Basic hazing involves directly facing the coyote, using a "big and loud" approach, and using various hazing tools to prevent coyotes from becoming desensitized to any particular tool. Use basic hazing to dissuade a coyote from approaching you, or if you see a coyote who is comfortable visiting yards. Be consistent and persistent: haze every time you see this too-close-for-comfort behavior. Basic hazing techniques include:

1. Yelling and waving your arms while approaching the coyote. You can also shake or wave a jacket, rake, broom, umbrella, or other big objects, such as unfurling and snapping a large garbage bag (see Sampson & van Patter 2020) over your head at the same time.

2. Creating loud noises with whistles, air horns, megaphones, soda cans filled with pennies, pots and pans.

3. During warm months, spraying water from a hose, water gun, or spray bottle (with vinegar water) ***in the direction of (not at)*** the coyote.

4. Throwing small objects like sticks, small rocks, cans, tennis balls, or rubber balls ***in the direction of*** the coyote, ***making sure you avoid hitting them***. However, because the risk of injury to coyotes from projectiles is an important well-being concern, ***this technique should only be used as a last resort***.

Importantly, when hazing a coyote you should also make sure to maintain eye contact with the coyote, so the coyote is aware the actions are directed at her/him, and continue hazing until the coyote departs. Success is not determined by the particular tool employed but by the intent of the user, clear communication, and unwavering persistence (Sampson & van Patter 2020).

Coexistence Strategies

Do **Not** Haze (if):

1. *You see a coyote during the day traversing public areas without causing conflicts.*

2. *You suspect the coyote is sick or injured.* In this case, contact your local wildlife rehabilitation center, humane society, or animal control officer(s).

3. *Between March and July, and you are in a park or open space where there could be a coyote den or pups present.* If you believe you might be close to a coyote den or that pups could be nearby, it is advisable to keep your pet close and calmly leave the area. A coyote may follow briefly to assess any potential threat to their pups, or until you leave the area to make sure there is no threat. This behavior is known as 'escorting'. Coyotes will typically stop escorting you've moved a certain distance away.

4. *The coyote is at a comfortable distance (>10 feet) from you and not exhibiting aggressive behavior.* This is especially important to consider at times when coyotes are most active, such as dawn and dusk. Seeing a coyote at a distance is no cause for alarm. They have adapted to urban environments and may be seen during the day and night.

Additionally, given safety concerns for humans and coyotes, *you should never*:

- Run from coyotes, which may trigger a predatory behavioral sequence
- Corner coyotes – always provide them with a safe, accessible and visible escape route
- Approach a coyote that seems sick or injured

Please refer to the below section on **General considerations for effective hazing** (in **Appendix C**) for additional information and tips.

High-Intensity hazing is a more aggressive approach that should only be used by trained professionals, such as animal control and police officers. It involves approaching the coyote quickly and aggressively, sometimes with trained dogs, and using items like paintballs, pepper/chalk balls, sling shots, clay pellets, or pepper spray (Lajeunesse et al. 2023). In a recent study, high-intensity aversive conditioning treatments with dogs and chalk balls initially reduced the likelihood of coyotes retreating during engagement, but increased the chances of retreat in subsequent encounters (Lajeunesse et al. 2023). High-intensity hazing should be reserved for professionals, specific areas, and used in response to more serious incidents.

Coexistence Strategies

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RELOCATION

Often, relocated animals attempt to return to their home territory but end up being killed by cars or hunters (Gehrt & Luft 2024, p.109). If they do survive, they may displace animals with established territories or disperse to new urban locations where conflict cases may recur. If relocated coyotes do not return to their home territory, another individual will soon fill the vacant territorial niche, potentially resuming or exacerbating conflict given their lack of familiarity with the area and where to secure food, water or shelter, therefore likely selecting for easily obtainable attractants (Conner et al. 1998, Fox 2006, Gehrt 2004, Sacks 1999b, Shivik 2014). Trapping (for relocation) also poses a risk to pets and other non-target animals in suburban settings. For these reasons, trapping is discouraged. In some states, relocating coyotes is illegal because they are considered to be a 'rabies vector species' (RVS).

Coexistence Strategies

LETHAL INTERVENTIONS

Coyotes' remarkable success appears to be closely related to human attempts to control their numbers. Unexploited coyote populations are self-regulating based on the availability of food, habitat, and territorial defense by resident family groups. Typically, only the parents (the 'dominant pair') in a family of coyotes reproduce, and they generally behaviorally suppress reproduction among subordinate members of the group (Gese 2005, Knowlton 1972, Knowlton et al 1999, Sacks 2005). Lethal control can disrupt coyote families, breaking them up, allowing more coyotes to reproduce at a younger age, encouraging larger litter sizes because of decreased competition for food and habitat, and increasing pup survival rates (Crabtree & Sheldon 1999; Kilgo et al. 2017, Knowlton et al. 1999).

The graphic below illustrates how predator management programs focused on killing coyotes disrupt the pack structure.

HOW PREDATOR MANAGEMENT DISRUPTS PACK STRUCTURE

Stable Coyote Family.
Only the dominant pair reproduces, and they behaviorally suppress reproduction among other family members and have small litters. Family members are less likely to prey on farmed animals.

Lethal Intervention.
Killing coyotes results in only a temporary reduction in population.

Coyote Family Disrupted.
Surviving members of the coyote family are broken apart, allowing more coyotes to reproduce at younger ages, and resulting in larger litter sizes and greater pup survival.

KEY
Female   Male   Pup   Yearling   Outside Coyote

Disrupting coyote families affects yearlings coyotes ability to learn hunting and foraging behaviors from older generations. This can lead to more conflicts with farmed animals, as inexperienced coyotes may be less cautious around humans, unfamiliar with the area, and more likely to be attracted to human food, increasing the likelihood of further conflicts.

Coexistence Strategies

"The predominant responses of coyote populations to lethal control efforts...Increase behaviors that further exacerbate the conflict."

~ Dr. Robert L. Crabtree
President and Founder
Yellowstone Ecological Research Center

Dave Parsons #CaptureCoexistence

The disruption of pack structure also compromises observational learning of natural hunting and foraging behavior across generations of coyotes, which can lead to an increase in killing of domesticated animals (Crabtree and Sheldon 1999, Mitchell et al. 2004). Additionally, the void created by removing coyotes who are not causing conflicts may be filled by other, naïve coyotes who may be less wary of humans, unfamiliar with the area, and therefore tempted by accessible attractants associated with humans, causing subsequent conflicts (Conner et al. 1998, Fox 2006, Gehrt 2004, Sacks 1999b, Shivik 2014).

Indiscriminate lethal control in the name of "management" persists, despite scientific evidence indicating this approach has significant negative ecological and well-being implications for coyotes and is ultimately economically and functionally ineffective (Fox 2006). Most states set no limit on the number of coyotes who may be killed, nor do they regulate the killing methods. While killing coyotes en masse or relocating individual coyotes can reduce their population in the very short term, it is not recommended for the clear and important reasons described above.

Some studies suggest targeted lethal removal of problematic individuals can be effective in reducing conflict (Breck et al. 2017). However, lethal interventions are also faced with multiple and substantial implementation challenges: it is extremely difficult to identify and target the animal responsible, the interventions are logistically difficult, time-consuming, expensive, and increasingly opposed by the public given increasing positive attitudes towards coyotes' well-being (Berger 2006, Drake et al. 2020, Sponarski et al. 2018, Worcester& Boelens 2007).

The challenges of lethal management and translocations highlight the importance of holistic education, reducing attractants and hazing as comprehensive, proactive, nonlethal approaches to managing human-coyote conflicts in urban areas. Lethal methods should be considered for instances of serious attacks only after non-lethal approaches have proven ineffective and the individual responsible has been reliably identified.

Coexistence Strategies

INCIDENT/ATTACK RESPONSE PLAN

COYOTE BEHAVIOR	CLASSIFICATION	RESPONSE
Coyote heard; scat or prints seen	Sign detection	Distribute educational materials on normal coyote behavior, coyotes' intrinsic and ecological value, appropriate human behavior for mitigating conflicts (including hazing), and reducing attractants (yard audit*).
Coyote seen moving in area	Sighting	Distribute educational materials on normal coyote behavior, coyotes' intrinsic and ecological value, appropriate human behavior for mitigating conflicts (including hazing), and reducing attractants (yard audit*).
Coyote seen resting in area	Sighting	Distribute educational materials on normal coyote behavior, coyotes' intrinsic and ecological value, appropriate human behavior for mitigating conflicts (including hazing), and reducing attractants (yard audit*).
Coyote entering a yard (no person or pet present)	Sighting	Distribute educational materials on normal coyote behavior, coyotes' intrinsic and ecological value, appropriate human behavior for mitigating conflicts (including hazing), and reducing attractants (yard audit*).
Coyote following or approaching a person (without pet)	Encounter	Distribute educational materials to the public, focusing on hazing. Post educational signs around coyote inhabited/frequented areas educating residents on normal coyote behavior and appropriate human behavior for mitigating conflicts (including hazing).
Coyote following or approaching a person and pet	Encounter	Distribute educational materials to the public, focusing on hazing and pet safety. Post educational signs around coyote inhabited/frequented areas educating on normal coyote behavior and appropriate human behavior for mitigating conflicts (including hazing) and pet safety.
Coyote entering a yard with pet(s)	Encounter	Distribute educational materials on normal coyote behavior, appropriate human behavior for mitigating conflicts (including hazing), reducing attractants (yard audit*), and pet safety. Gather information on animals involved, behavior, and context, including attractants in yard.
Coyote entering a yard and injuring or killing pet	Unattended pet attack	Gather information on animals involved, behavior, and context, including attractants in yard. Distribute educational materials on normal coyote behavior, appropriate human behavior for mitigating conflicts (including hazing), reducing attractants (yard audit*), appropriate coyote-proof fencing, and pet safety.
Coyote injures or kills pet off-leash in open space area	Unattended pet attack	Gather information on animals involved, behavior, and context. Distribute educational materials on normal coyote behavior, appropriate human behavior for mitigating conflicts (including hazing), reducing attractants (yard audit*), and pet safety. Post additional signage around coyote inhabited/frequented areas educating and alerting residents to keep their pets on leash and how to haze. Perform public area 'yard' audit. If it is pup-rearing season and the area is near a den site, block the area off until the pack moves. Consider Community Hazing Team† deployment, to intervene and to hold public informational and training sessions. Enforce ordinances to remain in control of pets when appropriate.
Coyote injures or kills a domesticated animal (non-pet)	Domestic animal predation	Gather information on animals involved, behavior, and context. Distribute educational materials on normal coyote behavior, appropriate human behavior for mitigating conflicts (including hazing), reducing attractants (yard audit*), and domestic animal safety, including deterrents (e.g. fencing/enclosures, supervision, guard animals).

Coexistence Strategies

INCIDENT/ATTACK RESPONSE PLAN

COYOTE BEHAVIOR	CLASSIFICATION	RESPONSE
Coyote injures or kills pet on leash or off-leash with human nearby	Attended pet attack	Gather information on animals involved, behavior, and context. Distribute educational materials on normal coyote behavior, appropriate human behavior for mitigating conflicts (including hazing), reducing attractants (yard audit*), and pet safety. Post additional signage around coyote inhabited/frequented areas educating and alerting residents to keep their pets on leash and how to haze. Perform public area yard audit. If it is pup-rearing season and the area is near a den site, block the area off until the pack moves. Enforce ordinances (to remain in control of pets, to not feed wildlife, etc.) when appropriate. Deploy Community Hazing Team† to the area, to intervene and to hold public informational and training sessions, and, if unsuccessful after various attempts, consider high-intensity hazing (by professionals).
Coyote aggressive toward human, showing teeth, back fur raised, lunging, nipping, without contact	Incident	Gather information on animals and humans involved, their behavior (before and after the incident), and context. Distribute educational materials on normal coyote behavior, appropriate human behavior for mitigating conflicts (including hazing), reducing attractants (yard audit*), and pet safety. Post additional signage educating and alerting residents to keep their pets on leash and how to haze. Perform public area yard audit. If it is pup-rearing season and the area is near a den site, block the area off until the pack moves. Deploy Community Hazing Team† to the area to intervene and to hold public informational and training sessions and, if unsuccessful after various attempts, consider high-intensity hazing (by professionals).
Coyote biting or injuring person after being encouraged to approach through: hand feeding, human approaching coyote and pups, intervening in pet attack, etc.	Provoked human attack	Gather information on animals and humans involved, their behavior (before and after the incident), and context. Humans bitten by a coyote should seek their physician's advice regarding the administration of a post-exposure rabies vaccination. Distribute educational materials on normal coyote behavior, appropriate human behavior for mitigating conflicts (including hazing), reducing attractants (yard audit*), and pet safety. Post additional signage around coyote inhabited/frequented areas educating and alerting residents to keep their pets on leash and how to haze. Perform public area attractants audit. If it is pup-rearing season and the area is near a den site, block the area off until the pack moves. Enforce ordinances (to remain in control of pets, to not feed wildlife, etc.) when appropriate. Deploy Community Hazing Team† to the area to intervene and to hold public informational and training sessions or, contingent on context, consider high-intensity hazing (by professionals). If the coyote is identified and killed, s/he should be tested for rabies and given a full necropsy to determine their general health and any contributing factors, such as wildlife feeding.
Coyote biting or injuring person without being encouraged to approach	Unprovoked human attack	Gather information on animals and humans involved, their behavior (before and after the incident), and context. Distribute educational materials on normal coyote behavior, appropriate human behavior for mitigating conflicts (including hazing), reducing attractants (yard audit*), and pet safety. Post educational signs around coyote inhabited/frequented areas educating and alerting residents to keep their pets on leash and hazing. Perform public area attractants audit. If it is pup-rearing season and the area is near a den site, block the area off until the pack moves. Enforce ordinances (to remain in control of pets, to not feed wildlife, etc.) when appropriate. Deploy Community Hazing Team† to the area to intervene and to hold public informational and training sessions or, contingent on context, consider high-intensity hazing (by professionals). If the coyote is identified and killed, s/he should be tested for rabies and given a full necropsy, to determine their general health and any contributing factors, such as wildlife feeding.

*See **Appendix B**.
†See **Appendix C**.

Coexistence Strategies

[STATE/LOCAL] LAWS/ORDINANCES

Besides the recommended measures mentioned earlier, the community may explore the following regulations:

Mandatory Leash Rule – The introduction of a leash law in hot spot areas, coupled with fines for off-leash dogs, can help address troublesome behavior that may contribute to conflicts between pets and coyotes. Residents should be advised to keep their pets leashed, with a maximum length of six feet.

No Wildlife Feeding Policy – Implementing a ban on feeding wildlife and instituting monetary penalties can effectively address problematic feeding practices that could lead to coyote habituation. Such ordinances should include prohibitions against leaving, storing, or maintaining any food or attractant in a manner, area, or location accessible to coyotes or other non-domesticated animals.

Police/state complaint/incident response protocols – Establishing protocols for government agents to effectively respond to incidents/attacks involving coyotes, including how to evaluate complaints and different categories of reported incidents (e.g., see **Milwaukee Coyote Management Plan**).

[INSERT ALREADY ESTABLISHED ORDINANCES FOR EACH COMMUNITY HERE]
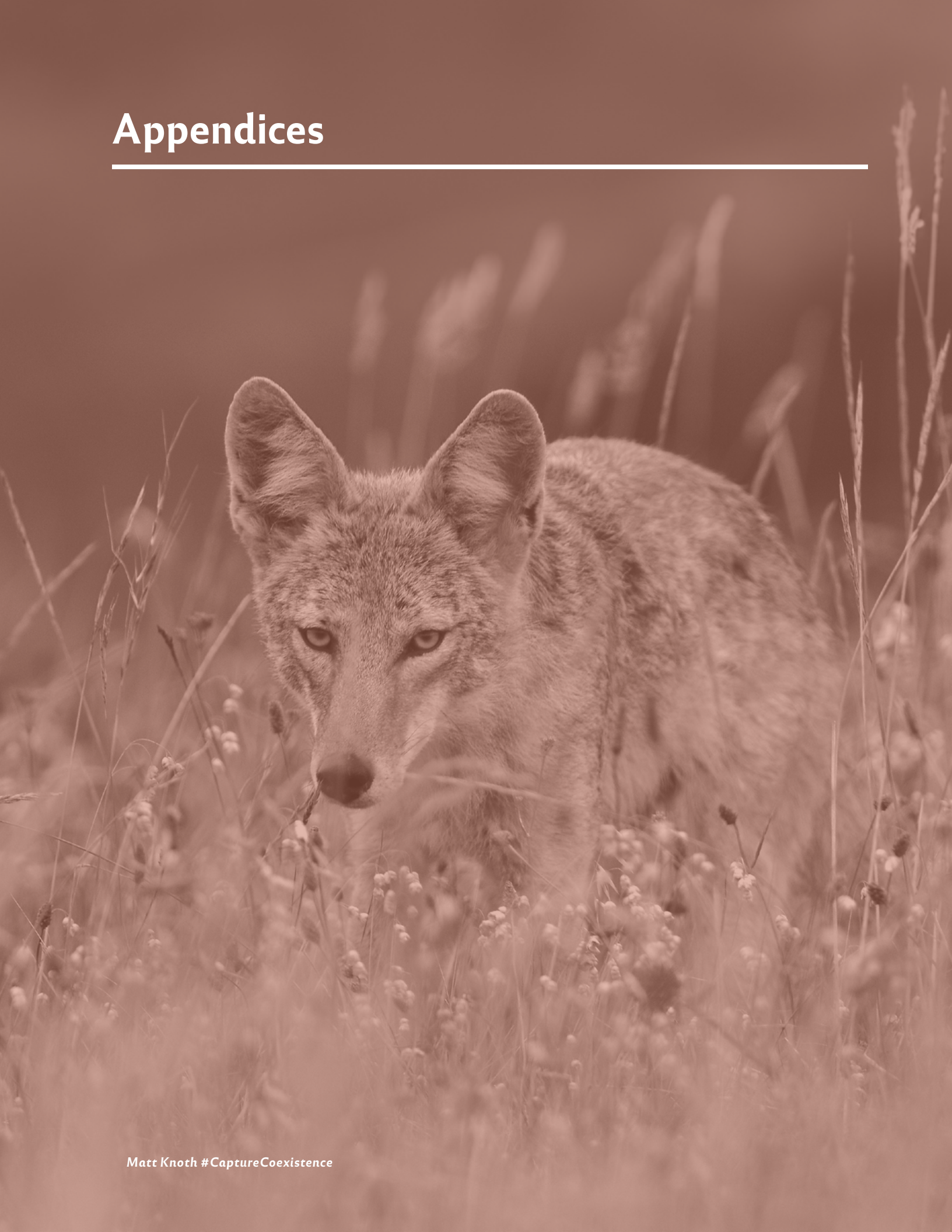
Appendices

Appendices

A: COYOTE ENCOUNTER/INCIDENT REPORT FORM
(FROM VIRTUAL REPORTING APP)

Name:

Email: **Phone #:**

Date of interaction: **Time of interaction:**

Location of interaction (pin on map):

Duration of interaction (minutes):

☐ <1

☐ 2–5

☐ 6–10

☐ 10+

Sighting/Interaction type:

☐ Sign   ☐ Sighting   ☐ Encounter

☐ Unattended Pet attack ☐ Domesticated animal predation ☐ Attended pet attack

☐ Incident (aggression towards   ☐ Provoked attack on human   ☐ Unprovoked attack on human
  human without contact)

How many coyotes did you observe?

☐ 1

☐ 2

☐ >2

☐ Heard, but did not see them all

What was/were the coyote/s doing?

☐ Mostly stationary: lying down, sniffing, standing, staring

☐ Moving slowly: walking, trotting

☐ Moving quickly: running, loping

☐ Escorting: walking behind or alongside person often accompanied by dog

☐ Hunting: stalking, eating, attacking, transporting an animal

☐ Vocalizing: howling, yipping, whining, whimpering, growling

☐ Other:

Appendices

A: COYOTE ENCOUNTER/INCIDENT REPORT FORM
(FROM VIRTUAL REPORTING APP)

What was the coyote/s demeanor?

- ☐ 0 (completely relaxed)
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 (completely stressed/excited)

Did the coyote/s appear sick or injured? ☐ No   ☐ Yes

Please describe:

How many humans were present?

Activity of reporting party prior to sighting/interaction:

- ☐ Walking
- ☐ Nature watching
- ☐ Other:
- ☐ Running
- ☐ Riding bike

Did you feed the coyote/s? ☐ No   ☐ Yes

Was there food present? ☐ No   ☐ Yes

Was a companion animal involved? ☐ No   ☐ Yes

Species/breed:

Size/weight:

Behavior before/during sighting/interaction:

Was the companion animal on a leash? ☐ No   ☐ Yes

If 'Yes', was the leash longer than 6ft: ☐ No   ☐ Yes

Appendices

A: COYOTE ENCOUNTER/INCIDENT REPORT FORM
(FROM VIRTUAL REPORTING APP)

Did you (or someone with you) haze the coyote? ☐ No ☐ Yes

Describe the sighting/interaction and its outcome, including how you hazed the coyote and the coyote's response:

How did you feel about the interaction? What made you feel that way?

May we contact you? Or, if possible, would you like to be contacted by your local animal services agency about this report?

☐ No ☐ Yes

Appendices

B: YARD AUDIT CHECKLIST

Key attractants for wildlife are food, water, and shelter. We encourage you to take steps to eliminate attractants on your property and in your neighborhood in order to minimize conflicts with coyotes and other wildlife. Minimizing conflicts is most effective when the entire neighborhood works together.

ATTRACTANT	NO	YES	RECOMMENDED ACTIONS	RATIONALE
Are you feeding coyotes, foxes, or other wild carnivores?			If YES, stop feeding immediately. You are putting your neighbors and their pets at risk.	Many jurisdictions have local or state laws prohibiting the feeding of wild animals. Animals that are fed by humans may lose their wariness and develop territorial behavior that can lead to aggression.
Are you feeding feral cats (domestic cats gone wild)?			If YES, consider stopping feeding federal cats. If you continue feeding feral cats you should provide food only during the day, at a set time, and offer an amount that the cats can consume within a short timeframe, removing any leftovers immediately, secure their food and water in coyote proof containers, or elevate dishes to a height of 1 meter or higher.	Coyotes and other animals will eat the food left out for feral cats. They may also prey on the cats.
Are you feeding birds, squirrels, deer, or other wildlife?			If YES, either stop feeding wildlife or make sure to clean up any fallen seed and mess.	Coyotes and many other wildlife are omnivorous and may eat the seed or prey on animals attracted by corn and seed.
Do you have food for your cat or dog outside?			If YES, stop feeding pets outdoors, and store all pet food indoors. If you need to feed outside, only do so during daylight hours, supervise feeding, and remove bowls promptly.	Leaving pet food outside is an invitation to wildlife. Wildlife will associate food rewards with humans and continue to return.
Do you have water available for wildlife to drink?			If YES, remove standing water bowls and any deep dishes or pools of water.	Wildlife stay in environments where food and water are available.
Do you let your cat go outside unattended?			If YES, you may want to consider other options, such as supervision, a fully enclosed "catio", or restricting access during times when coyotes are more active (dawn, dusk, nighttime).	If outside in an unprotected area, cats may face increased risk of harm from other animals.
Do you let your dog go outside unattended in an unsecured yard?			If YES, either be outside and close to your dog when s/he is in your yard or secure your yard with proper fencing.	If outside in an unprotected area, unsupervised dogs may face increased risk of harm from other animals.
Do you have fruit trees?			If YES, keep fruit trees fenced, pick up fallen fruit, and remove fruit from low branches.	Coyotes and many other wildlife species are omnivorous. Once they find an easy source of food they will continue to come back.
Could an animal get into your trash or recycling?			If YES, secure trash containers with locking lids or bungee cord. Consider waiting to take trash to the curb until the morning of pick-up.	Coyotes and many other wildlife species are omnivorous. Once they find an easy source of food they will continue to come back.
Do you have a compost pile?			If YES, secure the container with a coyote proof lid or bungee cord, or fence the area off.	Coyotes and many other wildlife species are omnivorous. Once they find an easy source of food they will continue to come back.

Appendices

B: YARD AUDIT CHECKLIST (CONTINUED)

ATTRACTANT	NO	YES	RECOMMENDED ACTIONS	RATIONALE
Do you have an outdoor grill or barbecue?			If YES, be sure to clean up food around grills after each use.	Coyotes and many other wildlife species are omnivorous. Once they find an easy source of food they will continue to come back.
Do you have shrubs or bushes that are low enough to the ground for an animal to hide in?			If YES, trim lower branches at least two feet above ground level.	Trimming vegetation helps eliminate hiding places for wildlife and potential sites for dens.
Do you have a deck a coyote or other animal could get under?			If YES, secure the space to keep animals out.	Wildlife can use spaces under decks as hiding places or locations for dens.
Do you have a woodpile an animal could hide in or behind?			If YES, cover or enclose your woodpile so that a coyote can't use it as a hiding place.	Wildlife can use woodpiles as hiding places.
Do you have any other places on your property that could serve as an animal hiding place or denning site?			If YES, restrict access to any location on your property that an animal could use as a hiding place or den.	Wildlife can use a variety of protected locations for dens or hiding places.

ADDITIONAL OPTIONS TO KEEP COYOTES OUT OF YOUR YARD

If you are unable to eliminate all attractants (e.g., sometimes you may need to leave your dog in your yard unattended and with water) or you want additional protection, fencing is a good option. It is important to understand that coyotes don't leap over fences in a single bound. Rather, they grip the top of the fence with their front paws and use their back legs to kick themselves up and over the fence. They are also excellent diggers and can burrow under fences. Here are a few fencing options to help keep coyotes out of your yard:

1. **Wire fence with outward facing overhangs** – A six-foot, woven wire fence with overhangs that face outward at the tip of each post should prevent coyotes from climbing over. Outward facing wire overhangs also can be added to existing fences. Some coyote experts consider such overhangs indispensable given coyotes' climbing abilities; e.g., a researcher witnessed a coyote climbing up an 8' chain link fence that was protected at the top with a hot wire. Additionally, to keep coyotes from burrowing underneath, an effective fence needs to extend at least 12 inches below the surface or have a galvanized-wire apron that extends out from the fence at least 15 inches.

2. **Coyote Rollers** affixed at the top of an existing fence or wall prevent a coyote from being able to climb up on the top of the fence. Depending on the location of the fence or wall, you may also need to add a barrier to keep coyotes from burrowing.

3. **Install motion activated lights**. Coyotes and other animals are sensitive to changes in their environment.

Appendices

C: IMPLEMENTING A COMMUNITY-BASED HAZING PROGRAM

A coordinated, community-based hazing program is indispensable for achieving the goals of establishing hazing protocols (see section on **Hazing techniques**), responding to conflicts in the least harmful manner, and improving human-coyote coexistence.

By necessity, a successful hazing program requires community involvement, understanding, and support. Local wildlife officers, police and residents are best equipped to respond consistently and at the most opportune times in their own neighborhoods, parks, and open spaces. With repeated hazing, coyotes can learn to avoid problematic behaviors, especially if the problematic behavior has not become a pattern or been reinforced.

Engaging the community in these efforts also has the added advantage of empowering residents and diminishing their fear of coyotes by providing them with the means to address conflicts with coyotes themselves in the least harmful manner possible.

The training locations should be selected by considering information gathered from the community regarding coyote presence in particular neighborhoods, parks, or open areas. These training sessions should be provided to participants at no cost.

TRAINING

Participants (wildlife officers, police or residents) should undergo education and training in the following areas before they attempt to haze coyotes on their own:

- Holistic education addressing coyote sentience, cognition and sociality
- Coyote ecology and behavior, including normal and abnormal coyote behavior
- Seasonal behavior changes — breeding season, pups, denning behavior
- History of coyotes and human-coyote interactions in the area
- How human behavior influences coyote behavior
- Reality (vs perceptions) of risks of coyotes toward people and pets
- Identifying/removing attractants, and deterring animals from entering private property
- Pet safety tips
- Appropriate response(s) when encountering a coyote in various contexts
- Hazing protocol goals, techniques and tools

Before enrollment, participants should be examined on their knowledge of the above topics. The training program should collect feedback from participants.

Appendices

ESTABLISHMENT OF 'COMMUNITY HAZING TEAMS' (CHTS)

Interested individuals should apply to be part of their neighborhood's 'Community Hazing Team' to the public department responsible for managing such interactions. Because the effectiveness of hazing should increase if implemented by neighborhood residents, to the extent possible, each neighborhood should have its own CHT. Ideal candidates should have no record of violations of wild or domestic animal protections or statutes.

Selected participants should receive appropriate training. Participants should be placed on a closed CHT email list through which updates, additional coyote information, electronic flyers, and handouts will be sent for community distribution.

CHTS: DEPLOYMENT AND MANAGEMENT

We suggest following guidelines for the deployment and management of a CHT:

- The CHT will be notified of "hot spots" in their neighborhoods through the CHT email list.
- The CHT will be asked to distribute educational materials to the public and post **BE COYOTE AWARE** and **DON'T FEED WILDLIFE** signs (including "pup denning" signs during denning season)
- The CHT will patrol the area(s), focusing activity around times when conflicts or attacks (i.e., not mere sightings or encounters) occurred.
- The CHT will fill out a Hazing Interaction Report documenting their use of (and response to) hazing. The report should include the following data:
  - Date, location, time of day, number of animals
  - Initial coyote behavior, hazing behavior, coyote response
  - Hazing techniques deployed
  - Additional comments
- The responsible government agency in charge of CHTs will develop a summary report on outcomes in addition to long-term and community-specific hazing goals for continued success in reducing conflict between coyotes and residents of the community.

Appendices

GENERAL CONSIDERATIONS FOR EFFECTIVE HAZING

- Levels of hazing need to be appropriately relevant to coyote activity.

    - Coyotes live in open spaces and the best practice (as a response to sign detection, sightings and encounters) is to leave them alone and to educate the public on reducing attractants and enhancing personal/pet safety.

    - Coyotes may be active at any time of the day, although in areas where people are active they tend to be more active at night or early morning. To reduce potential conflict, hazing is more appropriate during the day or during times where people and pets are present. For example, a chance encounter with a coyote in a park at 4 a.m. (without incident) may not require attempting to change that coyote's behavior.

- It is crucial to emphasize that effective hazing involves an initial phase of intensified, assertive, varied, and persistent efforts (Young et al. 2019). Coyotes, in the learning process, may initially be unresponsive to these techniques. This lack of response is common early on, especially when they lack prior exposure to hazing. Without a background in hazing experiences, coyotes may not grasp the intended response, which is to move away from the individuals. As coyotes become acquainted with hazing, their sensitivity to these methods tends to increase, making subsequent hazing efforts more effective.

- The application of hazing techniques and tools should be consistent whether addressing a single animal or a group of animals. Typically, the response of a dominant animal sets the tone, influencing others in the group to follow suit. It is important not to dismiss, turn away, or avoid hazing, even in the presence of multiple animals instead of a lone individual. Each interaction contributes to the overall effectiveness of the hazing process.

- The more often an individual coyote is hazed using a variety of tools and techniques and by a variety of people, the more effective hazing will be in changing that animal's future behavior (Young et al. 2019).

- Hazing must be directly associated with a person. The coyote must be aware of where the potential threat (e.g., a loud noise) is coming from and identify the person.

- Coyotes can and do recognize individual people and animals in their territories. They can learn to avoid or harass specific individuals in response to behavior of the person and/or pet.

Appendices

- Coyotes, like dogs, can exhibit routines or habits. Identifying their normal habits can help target which habits to change. For example, if a coyote patrols the same bike path at the same time in the morning three to five days a week, hazers should concentrate on that time and place to encourage the animal to adapt her/his routine to decrease contact with people/pets.

- It is crucial to consistently apply hazing at specific levels to ensure that successive generations of coyotes do not acquire or revert to behaviors associated with becoming habituated to human presence.

- It is critical to modify human behavior to support hazing, such as the continued identification of and, if necessary, removal of possible attractants.

- Education about exclusion techniques, including how to identify and remove attractants, removing fencing if necessary, personal responsibility in pet safety, and having reasonable expectations of coyote behavior are critical components of an effective coyote hazing plan.

- Coyotes are skittish by nature. Coyotes as a rule DO NOT act aggressively towards people. The one exception is a sick or injured animal.

Appendices

D: EXAMPLE COYOTE RESOLUTION

RESOLUTION NO. ____
A RESOLUTION APPROVING A COYOTE MANAGEMENT PLAN

WHEREAS, the City of _____ has a duty and responsibility to protect the public health, safety, and welfare of its residents; and

WHEREAS, the City of _____ acknowledges coyotes' intrinsic value and asserts they are important members of our social and ecological community; and

WHEREAS, the City of _____ desires to identify and achieve a balance between the importance of human and pet safety, coyotes' wellbeing, and the ecology of the region; and

WHEREAS, due to the varied interests of persons and organizations regarding actions that can be taken to coexist with coyotes, a written coexistence plan is desirable to ensure that the varied interests are evaluated and considered when seeking to address conflicts with coyotes; and,

WHEREAS, the City of _____ has developed a Coyote Coexistence Plan to provide recommendations for educating the community on living and interacting with coyotes, fostering positive attitudes and appreciation towards them, and provide compassionate, effective solutions to perceived or actual conflicts with them; and,

WHEREAS, a combination of holistic education and non-lethal measures have been found to be the most effective methods to alleviate the potential dangers that may result from coyote-human interactions; and,

WHEREAS, the _____ is directed to utilize non-lethal methods, including education, human behavior modification, and hazing, as primary methods in coyote coexistence, considering lethal responses only for instances of attacks, and only after non-lethal methods have proven ineffective and the individual responsible has been reliably identified.

NOW, THEREFORE, BE IT RESOLVED by _____, that:

The Coyote Coexistence Plan attached hereto and incorporated herein by reference, is hereby approved. The resolution shall be effective immediately.

APPROVED AND ADOPTED THIS _____ **DAY OF** _____

ATTEST _____

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3   Adapted from 'A Template Coyote Management & Coexistence Plan',
     The Humane Society of the United States.

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