



Milwaukee County Urban Coyote Management Plan



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Executive Summary

The Milwaukee County Urban Coyote Management Plan was developed per Resolution 15-690 and pertains to proposed management actions for coyotes on Milwaukee County owned parkland and natural areas. Since the adoption of Resolution 15-690 the Milwaukee County Department of Parks, Recreation and Culture has collaborated with the Wisconsin Department of Natural Resources and UW Urban Canid Project at the University of Wisconsin-Madison's Department of Forest and Wildlife Ecology to develop and implement an urban coyote management plan for Milwaukee County. In 2015, several facets of the management plan were implemented within Milwaukee County including a series of five county-wide coyote educational programs, the development of an online reporting platform for coyote observations in Milwaukee County, distribution of informational materials to Milwaukee County residents via web and media portals, and implementation of a pilot "trap-tag-track" program in Wauwatosa through which a total of four coyotes were captured, tagged, and subsequently monitored by wildlife managers and citizens.

Acknowledgement

As Milwaukee County continues to develop, our urban wildlife adapts to living in closer proximity to people. Occasionally, misconceptions develop and conflicts between people and wildlife can occur. In Milwaukee County we strive to balance the needs of our citizens with an appreciation, respect and understanding of urban wildlife and our natural functioning urban ecosystems.

This Urban Coyote Management Plan supports an increase in understanding of Milwaukee County's urban coyotes and a reduction in human-coyote conflicts. We want to thank the many people who have participated in the development of this plan and for the support of our policies and procedures.

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Coyote in Milwaukee by Jim Edlhuber

Table of Contents

Introduction	4
Comprehensive Management Plan	5-6
Terms Defined	7
Coyote Ecology	7
Identification	7
Range.....	8
Habitat	8
Diet	8
Social Structure, Reproduction, Activity Patterns	9
Coyotes and People	10
Habituation	10
Coyote Behavior.....	11
Management Tools	12
Non-Lethal	12-14
Lethal.....	14
Appendices	15
1. Education and Outreach	15-16
2. Coyote Monitoring	17-19
3. Coyote Incident/Attack Report.....	20-21
4. Wildlife Feeding.....	22
5. Yard Audit.....	23
6. Hazing	24
7. Incident Response Plan	25-26
8. Attack Response Plan.....	27
9. Urban Coyote Research.....	28
10. Literature Cited	29
11. Contact Information	30
12. Resolution 15-690	31

Introduction

The Milwaukee County Park System has long been a source of pride for the communities of Milwaukee County in southeastern Wisconsin. With 158 parks and parkways totaling over 15,000 acres, it offers a source of recreational enjoyment for citizens and visitors alike.

The Milwaukee County Parks Natural Areas Program is a creative use of partnerships that engages Wisconsin's largest concentrated human population through the science and beauty of restoration ecology. The Milwaukee County Park System has 9,200 acres of natural areas which comprise 75% of the county's remaining green space and includes upland and bottomland forest, fens, oak savanna, remnant prairie, open marsh, lagoons, pollinator gardens, and surrogate grasslands. These are natural resources that have been historically molded by the influences of a great lake, Wisconsin's ecological tension zone, and over 150 years of Euro-American settlement, and provide habitat for a remarkable diversity of plants and wildlife within Milwaukee County. The Park System provides numerous opportunities for people to experience a wide variety of wildlife in Wisconsin's most developed county.

One wildlife species that has garnered considerable attention is the coyote (*Canis latrans*). Humans have a long and storied relationship with coyotes. With increased concern about their presence in urban areas, there is a direct need for wildlife managers to adopt novel strategies to manage coyotes in human-dominated landscapes. With a wide and diverse urban stakeholder base, an essential part of any coyote management program must include informing, educating, and engaging members of the community about coyote behavior and ecology. Management strategies must also proactively manage urban coyotes rather than reactively respond to human-coyote conflicts.

The goal of this management plan is to provide wildlife managers and municipalities in Milwaukee County with the information and tools necessary to promote and maintain a positive coexistence between coyotes and people.

The Milwaukee County Urban Coyote Management Plan provides a detailed plan of action to increase awareness of coyotes and coyote behavior in Milwaukee County and respond appropriately to different levels of coyote activity. This plan focuses on proactive management and is based on the most recent scientific literature regarding urban coyotes, primarily featuring research in the Midwest (see Appendices 9,10), and prepared by experts from the University of Wisconsin-Madison's Urban Canid Project, Wisconsin Department of Natural Resources (WDNR), and Milwaukee County Department of Parks, Recreation & Culture (DPRC).

This plan defines relevant terms, details urban coyote behavior and ecology, introduces management strategies to proactively monitor and manage coyotes, and provides a comprehensive response plan based on tiered levels of coyote activity. Appendices expand on different aspects of each topic and provide the basis for future community education and outreach.

Comprehensive Management Plan

While rare, the purpose of this plan is to minimize conflict between coyotes and humans. Emphasis is placed on proactively managing the potential conflict on both an individual and community level as well as responding appropriately to different levels of coyote-human interaction.

How to use the following plan: The comprehensive management plan is organized by tiered levels of coyote activity ranging from occasional sightings to threats to human safety. Management responses, goals, and the parties responsible are outlined based on coyote activity.

The first section of the plan (“Ongoing”) is currently underway in Milwaukee County. These proactive efforts are critical to understanding coyote behavior and accurately implementing other steps of the plan.

Each subsequent step outlines a response for an increase in bold coyote behavior with unique goals and target audiences. These responses are collaborative efforts between urban wildlife biologists, local government entities, and residents of Milwaukee County. Responses focus on proactively addressing changes in coyote behavior and responding appropriately to each situation.

Action	Response	Goals	Responsibility
Ongoing:	Milwaukee County Coyote Watch (iNaturalist)	<ul style="list-style-type: none"> ● Monitor coyote behavior ● Identify trends ● Use as outreach platform 	<ul style="list-style-type: none"> ● Community (report sightings) ● Managers (monitor reports)
Coyote sightings and encounters in a community:	Public Education (Living with Urban Coyotes)	<ul style="list-style-type: none"> ● Educate public (focused on information in Appendix 1) 	<ul style="list-style-type: none"> ● Managers (facilitate education) ● Community (attend meetings, implement actions)
	Hazing	<ul style="list-style-type: none"> ● Prevent coyote habituation 	<ul style="list-style-type: none"> ● Community (implement techniques)
	Human behavior modification	<ul style="list-style-type: none"> ● Prevent coyote habituation ● Reduce local coyote activity ● Reduce food availability 	<ul style="list-style-type: none"> ● Community (implement techniques)
Conflict situations with bold or atypical coyote behavior in a community:	Reach out to area with escalated coyote activity	<ul style="list-style-type: none"> ● Educate public in target areas (focused on information in Appendix 1) 	<ul style="list-style-type: none"> ● Managers (facilitate education) ● Community (attend meetings, implement actions)
	Trap-Tag-Track Program	<ul style="list-style-type: none"> ● Uniquely mark coyotes to track behavior (see Appendix 2) ● Identify bold coyote behavior using iNaturalist 	<ul style="list-style-type: none"> ● Community (report sightings) ● Managers (facilitate trapping and tagging) ● Contractor (trap and tag coyotes)
	Hazing	<ul style="list-style-type: none"> ● Prevent coyote habituation ● Reduce undesired activity 	<ul style="list-style-type: none"> ● Community (implement techniques)
	Human behavior modification	<ul style="list-style-type: none"> ● Prevent coyote habituation ● Reduce undesired activity ● Reduce food availability 	<ul style="list-style-type: none"> ● Community (implement techniques)
Reported Pet Incident:	Verify incident	<ul style="list-style-type: none"> ● Confirm coyote incident ● Determine if tagged coyote responsible 	<ul style="list-style-type: none"> ● Managers (verify incident) ● Community (report incident)
	Enact response plan	<ul style="list-style-type: none"> ● Determine if lethal removal is warranted 	<ul style="list-style-type: none"> ● Managers (review incident) ● Contractor <i>if warranted</i> (lethally remove individual)
	Hazing	<ul style="list-style-type: none"> ● Prevent coyote habituation ● Reduce undesired activity 	<ul style="list-style-type: none"> ● Community (implement techniques)
	Human behavior modification	<ul style="list-style-type: none"> ● Prevent coyote habituation ● Reduce undesired activity 	<ul style="list-style-type: none"> ● Community (implement techniques)
Reported Human Attack:	Medical attention	<ul style="list-style-type: none"> ● Necessary medical attention to victim 	<ul style="list-style-type: none"> ● Law Enforcement and First Responders
	Verify attack	<ul style="list-style-type: none"> ● Confirm coyote attack ● Determine if tagged coyote responsible 	<ul style="list-style-type: none"> ● Community (report attack) ● Managers (verify attack)
	Enact attack response plan	<ul style="list-style-type: none"> ● Lethally remove responsible coyote 	<ul style="list-style-type: none"> ● Law Enforcement (dispatch coyote if in area) ● Contractor (locate, trap, dispatch coyote)

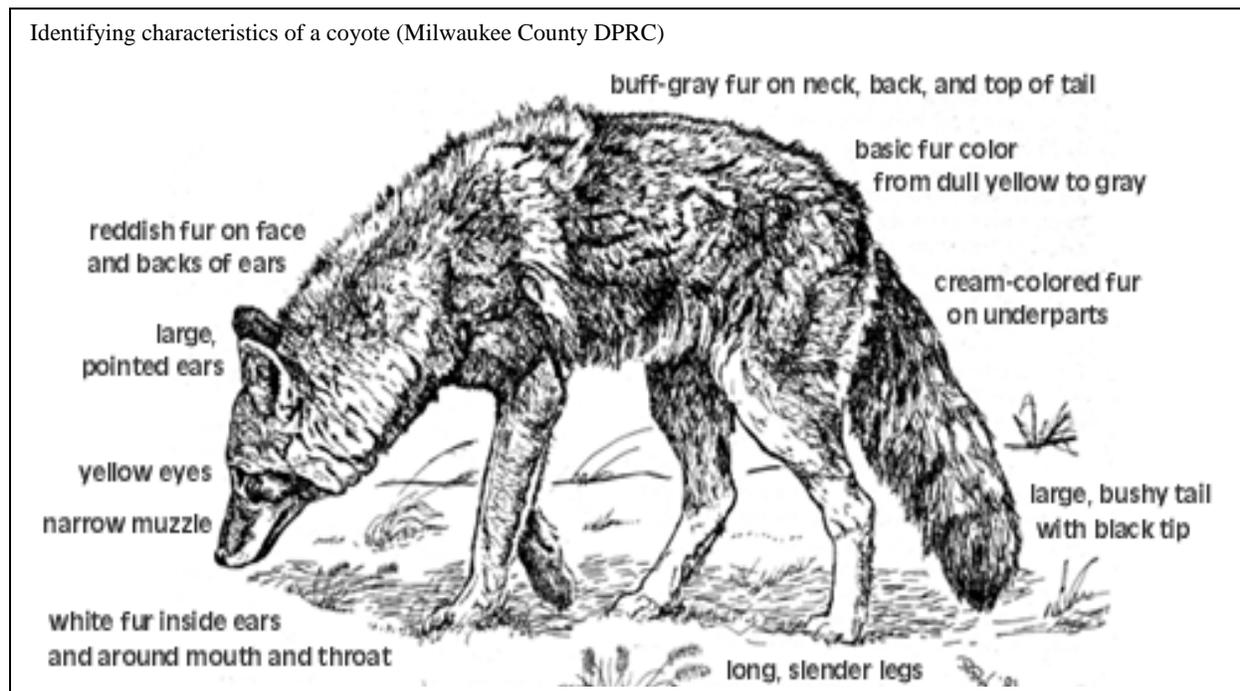
Terms Defined

Consistent terminology is critical for successfully communicating the goals and information contained in the Milwaukee County Urban Coyote Management Plan. In the context of this document, several terms will be used throughout and are defined here:

- **Sighting:** A visual observation of a coyote(s) at any time.
- **Encounter:** An unexpected, direct meeting between a human and coyote(s), with not physical contact and no aggressive behavior displayed by the coyote(s).
- **Nuisance:** An individual coyote repeatedly causing a conflict situation.
- **Conflict:** Occurs when an action by humans or wildlife has an adverse impact on the other.
- **Incident:** Reported conflict situation involving a coyote attacking a pet.
- **Attack:** Reported conflict situation involving a coyote attacking a human.

Coyote Ecology

Identification: The coyote (*Canis latrans*) is a member of the canid—or dog—family. In Wisconsin, other members of the canid family include the gray (timber) wolf (*Canis lupus*), the red fox (*Vulpes vulpes*), and the gray fox (*Urocyon cinereoargenteus*). Domestic dogs (*Canis spp.*) are also members of the canid family. Coyotes often resemble a small German Shephard with their grayish coat, pointed ears, long and slender snout, and bushy, black-tipped tails. Adult coyotes weigh between 25-40 pounds, but their thick coats often make them appear much larger, especially during winter months.



Range: Coyotes are native to North America but originated in the southwest United States. Their adaptability—along with the regional decline (extirpation) of larger predators—has facilitated a dramatic range expansion over the last century. Coyotes are now found all across North America and have established themselves in every major city continent-wide.

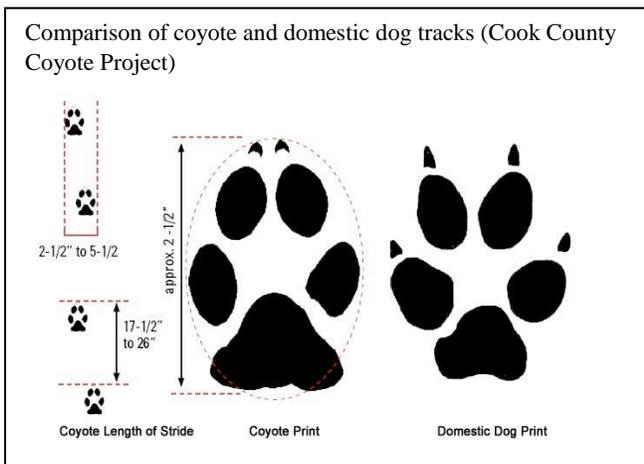
Habitat: Coyotes are habitat generalists, meaning that they can inhabit a wide variety of land uses (e.g. agriculture, urban, undeveloped) and covers (e.g. woodland, grassland, shrubland). This adaptability has allowed coyotes to successfully move into and live in (colonize) urban areas where food and shelter are seemingly abundant. It is important

to understand that coyotes were not forced to move into urban areas and it is not necessarily because urban areas have expanded into less developed areas; rather, they moved into and adapted to human-dominated ecosystems like they have adapted to many other North American ecosystems because of the availability of suitable habitat (e.g. food, water, shelter, and space).

Research has shown that in urban areas, coyotes spend the majority of their time in green spaces such as parks, golf courses, and cemeteries, but will move outside of and between these green spaces during dispersal periods and when they are hunting (Gehrt et al. 2009).



Comparison of coyote and domestic dog tracks (Cook County Coyote Project)



Diet: In addition to being habitat generalists, coyotes are also diet generalists and eat a wide variety of different foods. This is especially true in urban areas. Typically thought of as carnivores, coyotes are actually opportunistic omnivores that shift their diets to take advantage of the most available food source. Coyotes hunt other animals such as rabbits, squirrels, and small rodents, however, they will also consume fruits, berries, and other vegetation as a major part of their diet. Research conducted in Chicago, IL since

2000 has found that the majority of an urban coyote's diet consisted of small rodents, fruit, deer, and rabbits. They are also important predators of other abundant urban wildlife species such as Canada geese, squirrels, and rats. It is important to note that the majority of an urban coyote's diet is made up of natural foods and not human-based food such as trash items or pets (Gehrt 2006, Gehrt and Riley 2010).

Social Structure, Reproduction, and Activity Patterns: Coyotes either live in organized family groups or as solitary individuals. Family groups, or packs, defend territories from other coyotes. The size of the territory depends on the amount of available resources (food, water, shelter) within its boundaries. When resources are abundant, territories are typically smaller because coyotes do not have to go far to find sufficient food and shelter. Research has found that most urban coyote territories are between 1-4 square miles and are typically smaller than rural territories (Gehrt et al. 2009).

Pack size also depends on resource availability, but can range between 3-7 individuals in urban areas. Each pack has a dominant male and female that usually breed in February and produce 5-7 pups on average in April or May. The number of pups in each litter varies, but has been shown to fluctuate with mortality pressure (Bekoff and Gese 2003). Packs with increased mortality pressure will have larger litters to compensate for the higher risk of not surviving. This process is called compensatory reproduction (Sterling et al. 1983, Gehrt and Riley 2010). The female and pups stay in a den while other pack members hunt. Coyotes only use a den for about six weeks, until the pups are big enough to travel short distances on their own. Not all pups stay in the pack. Many of them disperse, or leave their existing, occupied territory in search of new territory at around 9-11 months of age.

Solitary—or transient—coyotes inhabit ranges larger than areas occupied by established packs. Ranges of solitary coyotes may overlap with pack territories and other solitary coyotes, and while they may be related to other coyotes in the area, they do not belong to a particular pack. These individuals search the landscape for areas not yet occupied by coyotes as well as fill vacant territories if established packs break up. Packs may break up for many reasons, including the death of a dominant member or a drastic change in resource availability.

Coyote in Milwaukee, WI (Todd Leech)



Research in Chicago, IL and Madison, WI suggests that coyotes in urban areas are most active after dark, although daytime activity is not uncommon (Gehrt and Riley 2010). Coyotes are naturally fearful of humans and associate them with danger; therefore, being active at night allows coyotes to avoid human activity. Nocturnal behavior also helps coyotes avoid vehicles while crossing roadways, which is the primary source of mortality for urban coyotes in the Midwest. Other sources of mortality include disease and malnutrition.

Coyotes and People

When coyotes live in urban areas, they are inevitably going to be living near and interacting with humans. Interactions may range from the occasional sighting with no incidents to nuisance behavior. In very rare and unusual circumstances coyotes have been reported to attack humans. People play a large role in how coyotes adapt to the urban landscape. Like all wildlife, coyotes need food, water, shelter, and space to survive. Human-dominated landscapes provide abundant amounts of these four factors.

While the vast majority of urban coyotes will not be seen by humans or cause problems, certain individuals in a coyote population can become nuisances in urban areas. Despite negative interactions (e.g. coyote attacks on domestic pets) being at the forefront of the topic of urban coyotes, these incidents are rare relative to the number of coyotes in urban areas. For example, researchers in Chicago, IL found that despite as many as two thousand coyotes living in the third largest metropolitan area in the United States, only a few incidents were reported annually, suggesting that typical or normal coyote behavior is to avoid interaction with humans (Gehrt 2006). Before addressing how to handle conflict situations, it is important to understand what causes conflict between humans and coyotes in the first place.

1. **Habituation:** Habituation is a process which occurs over a period of time where coyotes grow more tolerant of people because no negative consequences (e.g. people don't try to scare or harm them) occur when they are around humans. Typical coyote behavior is to avoid humans, but when a reward (e.g. food) is higher than the risk of interacting with a person, coyotes can become habituated towards humans. In other words, coyotes become less afraid of humans the more they interact with them, especially when food is involved.

Habituated coyotes present a greater potential for negative interactions with humans than non-habituated coyotes. To understand how to reduce habituation of urban coyotes to humans, it is important to know what factors of a human-dominated landscape attract coyotes. Coyotes will naturally be more attracted to areas that provide the following resources.

- a. **Food:** Whether directly or indirectly, humans provide coyotes (and other urban wildlife species) with access to food resources. Pet food, bird feeders, fruit trees, compost piles, gardens, and the small animals they attract are all examples of the abundant food resources that urban landscapes provide. (see Appendix 4)
- b. **Water:** Although coyotes can satisfy much of their water requirements from their diet, they will also drink available water. Water is available year round in urban areas. Human-made ponds, bird baths, and pet water dishes increase the amount of available water to urban coyotes.

Food attractants are split into two categories:

Direct: Food items consumed firsthand by coyotes

Indirect: Features that attract coyote prey items, which in turn attracts coyotes

- c. *Shelter*: While urban coyotes spend most of their time in green spaces, buildings, sheds, decks, and landscaping can all provide shelter for coyotes and allow them to live near humans without detection.
2. Coyote Behavior: Natural coyote behavior, whether in rural or urban areas, may create situations that cause a negative interaction between coyotes, humans, and domestic animals, especially dogs. Examples of these behaviors include:
- a. *Territoriality*: Coyotes set up territories where they protect resources, such as food and shelter. They will defend these territories against perceived competitors, including domestic dogs.
 - b. *Pup-rearing*: Coyotes become more territorial from April-July when pups are most vulnerable. Adult coyotes will defend den sites and stand their ground against potential threats to the pups. Humans and pets may be viewed as a threat to pups if they are near a den site.

Coyotes may perceive domestic dogs as competitors for resources or threats to pups. As a result, pet attacks may occasionally occur on domestic dogs and cats in urban areas. Research suggests that these attacks are likely territorial rather than predatory (Alexander and Quinn 2011).

Management Tools

Many strategies exist to manage coyotes in urban areas and can be broken down into two main categories: Non-lethal and lethal. Non-lethal management strategies are options that do not involve lethally removing coyotes. These strategies are intended to exploit the natural behavior and biology of coyotes to avoid unwanted interactions. Lethal strategies remove coyotes from the landscape by killing individuals using legal and regulated methods. Research shows that widespread lethal removal of coyotes is not effective for long-term population management (Sterling et al. 1983). Without addressing the factors that attracted coyotes in the first place, other coyotes fill the void left by the original individuals. Research suggests that the targeted lethal removal of individual “nuisance” coyotes can be effective in conflict management (Gehrt 2006).

Relocation, or moving individual nuisance animals from one area to another, is often considered a favorable management strategy by urban residents, however, research shows that is often misunderstood and is not an effective management option (Gehrt 2006, Craven et al. 1998). Studies on the relocation of territorial canids, like coyotes, show that most relocated individuals either die shortly after release or travel long distances attempting to return to their original territory. Relocation does not provide a humane alternative to lethal management strategies and simply relocates a habituated animal to cause the same conflicts in a new area.

In urban areas, non-lethal options provide more effective, long-term management than lethal options. Traditional coyote management in rural areas focuses primarily on regulated legal harvest. This is impractical in urban areas due to municipal ordinances regarding firearms, hunting, and trapping along with a more diverse stakeholder base with a wider range of attitudes and values towards coyotes. **Because of these factors, this plan prioritizes non-lethal strategies to proactively manage urban coyotes in Milwaukee County, WI. Milwaukee County will not permit “un-targeted” lethal removal of coyotes on Milwaukee County property unless it is a matter of direct human health and/or safety (i.e. verified attack on a human by coyote).**

1. Non-Lethal

- a. Education/Outreach: A critical element of this urban coyote management plan is the education and awareness of the residents of Milwaukee County. A successful coyote education program should emphasize coexistence between humans and coyotes as well as the variety of tools that residents can use on their own property and other areas where coyotes may be seen in order to prevent conflict. To be proactive, efforts should be county-wide, however, programs may be targeted to specific communities experiencing increased coyote sightings. Collaboration with other entities, such as universities, local non-profit organizations, municipalities, and the WDNR to distribute information and/or host educational coyote programming is recommended. Since the adoption of Resolution 15-690 the Milwaukee County DPRC has collaborated with the WDNR and the UW Madison Department of Forest and

Wildlife Ecology to complete a series of five county-wide coyote educational programs. A successful outreach program should use different platforms to reach as many participants as possible. For more details on educational content and delivery, see Appendix 1.

- b. **Coyote Monitoring:** In most urban areas, residents are unaware of coyote presence until a conflict situation occurs. A proactive monitoring system allows wildlife managers and residents to communicate coyote activity before coyotes become a nuisance. Online platforms, such as iNaturalist, can be customized and implemented for citizens to report sightings and encounters with coyotes and for wildlife managers and researchers to collect information on the behavior of coyotes within an area of interest. In addition to monitoring behavior, detailed records of incidents with coyotes must be reported, recorded, and reviewed consistently. Since 2015, the Milwaukee County DPRC has collaborated with the WDNR and the UW Madison Department of Forest and Wildlife Ecology to develop an online reporting platform for coyote observations in Milwaukee County. Additionally, four coyotes were captured, tagged, and monitored in a pilot “trap-tag-track” program in Wauwatosa. For more details on implementation of coyote monitoring systems, see Appendix 2.
- c. **Individual Behavior Modification**
 - i. **Wildlife Feeding:** Feeding is one of the primary reasons that coyotes become habituated. This can be intentional or unintentional but ultimately results in a coyote associating a location with an attractant such as food. Eliminating food sources at both a yard and neighborhood level will limit the amount of time a coyote spends in an area as well as decreasing the chance of attracting coyotes in the first place. For specific details on wildlife feeding and removing attractants, see Appendices 4,5.
 - ii. **Hazing:** Hazing is one of the most effective ways to manage coyote encounters in urban areas. The goal of hazing is to reverse the effects of habituation by associating humans with fear. In order to be effective, hazing needs to be done on both an individual and community level. For specific details about implementing hazing programs, see Appendix 6.
 - iii. **Monitor Pets:** Residents are encouraged to always keep cats indoors and monitor dogs while outside. Urban coyotes are typically nocturnal and concentrate their activities within green spaces. If a home is near green spaces like parks, golf courses, cemeteries, and other natural areas, residents should be extra vigilant. If coyotes are known to be in the area—especially if they have been aggressive towards pets—pets should not be left outside and unattended. While fences can deter coyotes from entering a residential yard, pet owners should remain vigilant while pets are outside. Coyotes are the focus of this document, but other wildlife species (e.g. owls, hawks, raccoons) can also pose threats to domestic pets. In order to limit potential interactions between pets and coyotes, Milwaukee County leash ordinances (47.06) must

be followed at all times while walking dogs, especially on Milwaukee County Park's property.

2. Lethal

In rare cases, individual coyotes may become habituated to a point where hazing and other non-lethal methods are ineffective. If repeatedly bold, nuisance coyotes can be properly identified, targeted lethal removal of that individual can solve conflict situations without creating the void described above.

Accurate identification of the nuisance coyote is the major hurdle for this management tool. In areas where bold animals have been reported, it is recommended that coyotes be live-trapped and tagged with unique markers that both residents and managers can identify. This allows managers to connect behaviors back to individual coyotes and identify nuisance animals. It would also make targeted lethal removal a viable management strategy in certain cases. (See Appendix 2)

There are currently no designated Milwaukee County funds available to fund the targeted removal of nuisance coyotes; however, this plan strongly recommends that financial resources be appropriated to a discretionary fund to be used to implement targeted lethal removal when necessary. Municipalities may also contribute funds to targeted implementation of removal. Exact costs will vary depending on the number of targeted coyotes and the third party independently contracted for removal.

Appendix 1: Education and Outreach

A major component of this urban coyote management plan involves increasing the awareness of Milwaukee County residents. Education and outreach will increase the public's awareness and understanding of coyote ecology and behavior, empower residents and allow them to implement aspects of this plan on a local level, and increase tolerance for coyotes, thereby increasing the possibility for a positive co-existence between humans and coyotes.

Education and outreach efforts need to share a consistent message across Milwaukee County. Content should be consistent with the most current research and literature on urban coyote ecology and management. Programs should focus on the following components and include relevant content from this management plan:

- Coyote ecology and a reasonable expectation of coyote behavior
- Decreasing attractants in yards and neighborhoods
- Increasing pet and human safety
- Hazing (techniques and expectations)
- Proactive coyote monitoring

Milwaukee County boasts a large, diverse population of citizens. Some media outlets are better than others in terms of reaching different audiences; in order to reach as many residents as possible, outreach efforts should span across several different platforms. These outlets include, but are not limited to, the following:

- Informational workshops and presentations
 - County-wide, but also targeted within communities with high coyote activity
 - Distribute informational brochures and/or flyers to the public through venues such as municipal buildings (i.e. city halls, public libraries, local police departments), nature centers, park kiosks, and local wildlife rehabilitation centers
- Permanent/seasonal outreach
 - Signs at trail heads in public natural areas with coyote activity
- Local media
 - Press releases
 - Radio
 - Newspaper
 - Television
- Online resources
 - Milwaukee County Parks Coyote Page (<http://county.milwaukee.gov/Coyotes9205.htm>)
 - Link to other resources
 - UW Urban Canid Project (<http://uwurbancanidproject.weebly.com/>)
 - Cook County Coyote Project (<http://urbancoyotereseach.com/>)

- WDNR “Urban Wildlife” webpage
(<http://dnr.wi.gov/topic/wildlifeHabitat/urban.html>)
- WDNR “Keep Wildlife Wild” webpage
(<http://dnr.wi.gov/topic/wildlifehabitat/orphan.html>)
- Milwaukee County Coyote Watch Journal/Blog
(<http://www.inaturalist.org/projects/milwaukee-county-coyote-watch/journal>)
- Social Media
 - Actively promote using Facebook page(s)
 - Post updates, information, seasonal tips
 - Engage members of the public on iNaturalist
 - Discussion forum
 - Blog
 - Explore other social media platforms
 - Twitter

Appendix 2: Coyote Monitoring and Reporting

Research in the Midwest has shown that even when coyote populations are high, most urban residents are unaware of their presence. Often, the only time that residents hear about coyotes in urban areas is after a conflict situation. To more effectively manage urban coyotes, managers need to monitor coyote behavior before it potentially escalates to a conflict situation. The goals of this monitoring program are as follows:

1. Identify where residents encounter coyotes in Milwaukee County
2. Collect behavioral information about each encounter to track potential patterns of habituation of coyotes
3. Identify potential “hot-spots” of coyote activity
4. If resources permit, conduct trap-tag-track programs to assist in potentially identifying nuisance animals and better understand local behavior patterns
5. Engage residents of Milwaukee County with urban coyote management

Milwaukee County Parks has created an online coyote reporting webpage on iNaturalist.org called the “Milwaukee County Coyote Watch.” This page is monitored by both Milwaukee County Parks and WDNR staff. This page has been customized to allow the public to upload sightings or encounters with coyotes within the county. Observations are compiled on an interactive map displaying reports from the entire county. This format allows administrators to view, analyze, and interpret data from the reports while letting the public see where coyotes have been observed and reported throughout the county.

This citizen-based monitoring platform engages residents of Milwaukee County directly in coyote management and makes them valued contributors to the management plan.

Along with recording the location of each observation, the Milwaukee County Coyote Watch asks observers a series of behavioral questions each time they record an observation. These questions help to gauge the level of habituation of the observed coyote, as well as allow administrators to monitor trends in habituation across the county to identify “hot-spots” of coyote activity. These “hot-spots” will be targeted with education and outreach efforts to inform residents of coyote behavior and give them tools to address the root cause of the coyote behavior (hazing, eliminate food attractants, etc.).

Examples of questions used to track behavior of observed coyotes:

- Time of Sighting
- “Did the animal see you?”
- “How close were you to the animal?”
- “If the animal saw you, did it run away?”
- “On a scale of 0-5, describe the aggression of the animal”
- “Was an attempt made to haze the animal?”

If administrators and wildlife managers continue to see an increase in nuisance coyote behavior in these areas, a “trap-tag-track” program can be implemented to monitor specific coyote behavior and inform further management decisions. Milwaukee County may independently contract a trapper from an approved list of trappers to live-capture coyotes in the target area. Trapping would occur primarily on Milwaukee County Parks’ property with appropriate permits. In some cases, trapping may occur in residential yards and neighborhoods with landowner permission. Cable restraints have been used to successfully trap coyotes in urban areas frequently

used by humans and domestic dogs and would be used exclusively for the trap-tag-track program. All trapping would abide by WDNR trapping regulations and best management practices for live-trapping coyotes using cable restraints. The County would grant the approved trapper a Right-Of-Entry permit to live-trap coyotes on County land. WDNR would grant Milwaukee County Parks a research permit to trap coyotes.

Before trapping would begin on public property, Milwaukee County Parks would post information about coyotes, cable restraints, and leash ordinances at trail-heads and message boards in target areas, informing the public of the trapping process. All traps would be placed no less than 25 yards away from marked trails and walkways.

Coyotes would be tagged with colored combinations of ear tags (see photos at right). These tags are bright and easily recognized by managers and the public. Each coyote would have its own unique color combination to allow for the identification of individuals on the landscape. If resources permit, coyotes could also be fitted with a GPS-enabled radio collar allowing researchers to collect information about the spatial ecology of the coyote. This location data would provide valuable insights into habitat use and behavior of urban coyotes.

The “trap-tag-track” program would allow residents and wildlife managers to identify individual coyotes and determine which individuals are displaying nuisance behavior. If Milwaukee County Parks and WDNR officials determine that targeted lethal removal is warranted, the ear tags would potentially allow for the targeted removal of the correct individual (see Management Plan flowchart and Incident Response Plan for more information on removal). In early 2016, four coyotes were capture, tagged, and subsequently monitored in a pilot “trap-tag-track” program in Wauwatosa.

Examples of ear-tagged coyotes (UW Urban Canid Project)



There are currently no designated Milwaukee County funds available to fund a future “trap-tag-track” program; however, this plan strongly recommends that financial resources be appropriated to a discretionary fund to be used to implement this program when necessary. Municipalities may also contribute funds to targeted implementation of this program. Exact costs will vary depending on the number of target areas, whether or not GPS collars would be used, and the third party independently contracted to trap.

In addition to tracking coyote behavior, coyote attacks on pets should also be documented and tracked in Milwaukee County. Monitoring these incidents will allow managers to respond in an efficient and consistent manner.

All incidents should be reported to Milwaukee County or the WDNR using the reporting form on the following page (Appendix 3).

All reported incidents involving pets would be responded to following the protocol included in this document. If a coyote attacks a human, the incident should immediately be reported to local law enforcement. Milwaukee County Parks and WDNR officials would respond using the corresponding protocol in this document.

Appendix 3: Coyote Incident Report

(Modified from the City of Mequon Coyote Nuisance Management and Response Plan Policy)

1. Received by: _____
2. Incident/Attack Date: _____
3. Incident/Attack Time: _____ AM or PM
4. Location (please provide nearest address or cross street):

5. Incident Type (incident types defined below)

- Sighting
- Encounter
- Aggressive Behavior
- Incident
- Attack

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

Encounter: An unexpected direct meeting between human and coyote(s) with no physical contact and no aggressive behavior displayed by the coyote(s)

Aggressive Behavior: Meeting between a pet or human and coyote(s) that results in one of the following types of aggressive behavior: growling, baring teeth, lunging

Incident: Reported conflict situation involving a coyote physically attacking a pet

Attack: Reported conflict situation involving a coyote physically attacking a human

6. Please Describe the Sighting / Encounter / Aggressive Behavior / Incident / Attack:

7. How Many Coyote(s) did You See? _____

8. Did the Coyote Appear Sick or Injured? Yes or No (if No, please skip to #10)

9. If yes, Please Describe (e.g. limping, foaming at the mouth, missing patches of hair):

10. Are You Aware of a Food Source in the Area where the Incident Occurred? Yes or No

11. If yes, Please Describe (*e.g. bird feeder, bait pile, animal carcass, etc.*):

12. Was an Attempt Made to Haze/Discourage the Coyote? Yes or No (*if No, please skip to #15*)

13. If yes, What Efforts were made to Haze/Discourage the Coyote? (*mark all that apply*)

- Shouting
- Noise Maker
- Garden Hose or Water Gun
- Throwing Object(s)
- Other _____

14. Please Indicate how the Coyote Reacted to the Hazing?

- Unfazed by Hazing Efforts
- Walked/Trotted a Short Distance and Stopped
- Walked/Trotted Away without Stopping
- Ran a Short Distance and Stopped
- Ran Away without Stopping
- Other _____

15. Please Provide any Additional Information/Detail about your Incident not covered elsewhere

16. Please feel free to attach photographs or other documentation to this report that you feel is appropriate. If you are submitting this report to document an attack on your pet, please attach photographs of the injuries.

17. Contact Information

Name: _____

Address: _____

Phone: _____

E-Mail: _____

Appendix 4: Wildlife Feeding

Feeding is perhaps the primary reason that a coyote becomes habituated. Eliminating food sources is the first step that residents or communities can take to reduce coyote activity in their areas. Feeding can be broken into two distinct categories:

1. Direct: Direct feeding includes both intentionally leaving food out for wildlife or feeding pets outdoors where coyotes have access to the food.
2. Indirect: Indirect feeding can be more complicated than direct feeding. Coyotes are opportunistic feeders and will utilize a variety of available food. For example, bird feeders may attract coyotes to a yard in two ways: First, coyotes will eat available bird seed, and second, as seed drops on the ground, other mammals such as small rodents, squirrels, rabbits, cats, and raccoons will be attracted to the dropped seed in turn attracting larger predators such as foxes and coyotes. Examples of other indirect food sources include vegetable gardens, compost piles, and outdoor grills. Scraps in compost piles may provide food for coyotes, but these piles also provide good habitat for the animals that coyotes prey upon. Outdoor grills have grease pans and food bits on the grill that may attract coyotes as well. If any of these indirect sources of food are attracting coyotes, they should be removed or wildlife access to them should be restricted.

Appendix 5: Yard Audit

This audit is designed to be distributed to homeowners and used on individual properties. Homeowners are encouraged to share this audit with neighbors and community members because minimizing interactions with coyotes works best when entire communities work together. (City of Mequon Coyote Nuisance Management and Response Plan Policy)

Item	OK	FIX	N/A	Ways to Mitigate
Food				NEVER hand-feed or intentionally feed a coyote!
Pet Food				Never feed pets outdoors; store all pet food securely indoors.
Water Sources				Remove water attractants such as pet water bowls, and open water buckets. Cover rain barrels.
Bird Feeders				Remove bird feeders or clean fallen seed to reduce the presence of small mammals that coyotes prefer to eat.
Fallen Fruit				Clean up fallen fruit around trees.
Compost				Do not include meat, fat, or dairy among compost contents unless compost bin is fully enclosed.
Outdoor Grills				Clean up food around outdoor grills and clean drip-trays after each use. Keep grill cover closed when not in use.
Trash				Secure all trash containers with locking lids. Periodically clean cans to reduce residual odors.
Landscaping				Trim vegetation to reduce hiding places and potential denning sites.
Structures/ Outbuildings				Restrict access under decks and sheds, around wood piles, or any other structure that can provide cover or denning sites for coyotes or their prey.
Fencing				Establish a 6-foot fence (only as permitted by City code and/or Homeowner Association [HOA] regulations) to deter coyotes. Ensure that there are no gaps and that the bottom of the fence extends underground 6 inches or is fitted with a mesh apron to deter coyotes from digging underneath. Roller-bars can be installed to prevent coyotes from climbing fences.
Pets				Never leave pets unattended outside, even in fenced yard
				Never allow pets to “play” with coyotes.
				Fully enclose outdoor pet kennels.
				Obey leash laws and walk pets on a lead no longer than 6’.

Appendix 6: Hazing

Human behavior shapes the way that coyotes behave in urban areas. People have the ability to change coyote behavior by removing attractants and responding to coyotes appropriately. Hazing involves modifying human behavior to instill a coyote's natural fear of people. Proactive urban coyote management relies on preventing coyotes from becoming habituated; hazing is a key piece of this process.

Successful hazing programs have several key facets:

- Techniques must be taught to residents and communities by wildlife managers on a regular basis
- Hazing must be sustained and consistent
- Hazing must be continued on a neighborhood scale for maximum effectiveness
- Hazing requires monitoring to gauge effectiveness (through iNaturalist and trap-tag-track programs)

Categories of hazing techniques include:

- Human Behavior: Yelling, waving arms, and clapping to scare a coyote.
- Noisemakers: Whistles, air horns, pots and pans, and “shaker” cans (i.e. pennies or stones inside an aluminum can)
- Projectiles: Sticks, balls, small rocks
 - Note: Projectiles should be thrown in direction of coyote, not intending to harm coyote
- Other: Spraying water at a coyote with a garden hose

Coyotes must be hazed until they have left the vicinity. If hazing stops before the coyote leaves, it will not be effective. It is best to implement a variety of hazing methods to constantly keep coyotes from getting used to one individual tactic. If a coyote does not leave the area or approaches a human after repeated hazing attempts, that person should remove themselves from the area and contact the WDNR. If you suspect a coyote is sick or injured, contact the Wildlife Rehabilitation Center at the Wisconsin Humane Society at 414-431-6204

Hazing is most effective when implemented on a community-level. Training opportunities should be targeted at communities, especially those reporting coyote activity. Residents are encouraged to share hazing information with neighbors and community members.

Hazing efforts should never aim to harm coyotes; injured or sick coyotes are less predictable and more difficult to haze. Hazing tactics should not be used when pups are present or at den sites; coyotes are likely to be extremely defensive of these areas. In these situations, humans should temporarily remove themselves from the area instead of hazing coyotes. Coyotes only use a den site for the first 6-8 weeks of pup-rearing season.

Appendix 7: Incident Response Plan

The following is the proposed course of action that Milwaukee County would follow should a tagged coyote attack and/or fatally wound a pet either on Milwaukee County owned property. Milwaukee County will not permit “un-targeted” lethal removal of coyotes on Milwaukee County property unless it is a matter of direct human health and/or safety (e.g. verified attack on a human by coyote).

1. Incident Report Filed
2. Verification of pet incident:
 - a. Milwaukee County, in conjunction with the WDNR, will verify the pet incident and whether or not a coyote was responsible using first-hand information from the incident.
 - i. Picture/video footage of incident
 - ii. In the case of a deceased pet
 1. Analyze spacing and diameter of any canine teeth bite/puncture marks
 2. Coyote sign in area (tracks, scat)
 - iii. Eyewitness account
 1. Pet attended by owner?
 2. When did the incident occur?
 3. If on park property, was the pet on a leash?
 4. Has there been a history of bold coyote activity in the area?
 5. Are any attractants present in yard or immediate area?
 - a. Based on Yard Audit (Appendix 5)
 - b. If it is verified that a coyote was responsible for the incident, the WDNR will work with the County to determine if the circumstances warrant targeted lethal removal (e.g. overly aggressive, habituated animal; pet owner fully responsible for pet). This decision will ultimately go to Milwaukee County officials for internal review.
 - c. If Milwaukee County determines the circumstances of the incident do not warrant targeted lethal removal (e.g. the pet owner was not responsible for their pet), implementation of aggressive hazing programs and educational outreach will be recommended in that target area. The WDNR will provide residents with private property coyote management options as well.
3. Permitted targeted lethal removal:
 - a. Milwaukee County would apply for a “coyote nuisance removal permit” with the WDNR in order to trap animals with the use of cable restraints outside of the State regulated trapping season (December 1st – February 15th). During the open trapping season no permit from the WDNR will be required by Milwaukee County.
 - b. Milwaukee County would permit a trapper from an approved list of trappers to trap the identified animal involved in the verified pet attack.
 - i. There are currently no Milwaukee County funds available to fund the trapping and removal of any animal. The selected trapper would be permitted to keep

the animal's pelt, but would otherwise be conducting the trapping at their own expense unless funds become available for contracted removal.

1. A municipality may hire a trapper to conduct trapping on Milwaukee County property for the targeted lethal removal of the animal per Milwaukee County's approval.
 - ii. Any selected trapper is required to have a valid trapping license, no wildlife violations, and an approved Right-of-Entry permit from Milwaukee County.
- c. If the targeted animal is captured:
- i. **Option A:** The local police department would be requested to properly dispatch the animal.
 - ii. **Option B:** Trappers are legally permitted by the State to dispatch trapped coyotes utilizing methods pursuant to both municipal and county ordinances.

Appendix 8: Attack Response Plan

In the case of a reported attack on a human:

1. Dispatch of emergency services:
 - a. First priority in this situation is to ensure the health and safety of the human involved by making sure victim receives proper medical treatment.
 - b. Law enforcement services will attempt to possibly locate the aggressive animal if still in the area.
 - i. If located, local law enforcement officers will be permitted to dispatch the aggressive animal responsible for the attack.
2. If the aggressive coyote cannot be located:
 - a. Milwaukee County, in conjunction with the WDNR, will verify the attack and whether or not a coyote was responsible for the attack using first-hand information from the attack.
 - i. Was the coyote ear tagged?
 - ii. What was the coyote doing before/after the attack?
 - iii. Where did the coyote run after the attack?
 - iv. Any identifying characteristics (if not ear-tagged)?
 - v. Has there been a history of bold coyote activity in the area?
 - b. If it has been verified that a coyote was responsible for an attack, the WDNR will work with Milwaukee County, local law enforcement, and a contracted trapper if necessary to locate and dispatch the aggressive coyote.

Appendix 9: Research Summary

Urban coyote research is a relatively new branch of wildlife research, but several projects in the Midwest and around the country are leading the way to explore the ecology of urban coyotes and understand ways to live with them.

- The Cook County Coyote Project (Chicago, IL): The Cook County Coyote Project is a comprehensive study of coyotes in the Chicago metropolitan area. Also known as the Urban Coyote Research Program, the study was initiated in 2000 as a non-biased attempt to address shortcomings in urban coyote ecology information and management; the Coyote Project is still underway. With the help of many key agencies, a continuous subset of coyotes is live-captured, collared, and released at their capture site. Coyotes are monitored to understand how they live in urban areas and how they interact with other wildlife, domestic animals, and humans. (<http://urbancoyotersearch.com/>)
- The UW Urban Canid Project (Madison, WI): The UW Urban Canid Project (UWUCP) is studying red foxes and coyotes in Madison, WI. The project aims to investigate the way canids are living in Madison and how humans can coexist with these wild neighbors. The project also focuses on engaging and incorporating the public into research and management. (<http://uwurbancanidproject.weebly.com/>)
- 2016 Pilot “trap-tag-track” program (Wauwatosa, WI). In February of 2016, Milwaukee County DPRC collaborated with WDNR and the UW Madison Department of Forest and Wildlife Ecology’s urban canid project to implement a pilot “trap-tag-track” program in Wauwatosa through which a total of four coyotes were captured, tagged, and subsequently monitored by wildlife managers and citizens.
- National Park Service Urban Carnivore Project (Los Angeles, CA): National Park Service biologists have spent several years studying the behavior and ecology of coyotes living in fragmented habitats adjacent to urban development in the Santa Monica Mountains and Simi Hills of southern California, west of the city of Los Angeles. (<https://www.nps.gov/samo/learn/management/coyote-research.htm>)
- The Gotham Coyote Project (New York, NY): Researchers, educators, and students working together to study the ecology of the northeastern coyote in New York City (NYC) and the region. The goal of the project is to tell the story of the NYC coyote and to help promote understanding and coexistence. (<http://www.gothamcoyote.com/>)

Appendix 10: Literature Cited

- Alexander S. M. and M. S. Quinn. 2011. Coyote (*Canis latrans*) interactions with humans and pets reported in the Canadian print media (1995–2010). *Human Dimensions of Wildlife* 16: 345-359.
- Bekoff, M. and E. M. Gese. 2003. Coyote (*Canis latrans*). Pages 467-481 in G. A. Feldhamer, B. C. Thompson, and J. A. Chapman, eds. *Wild Mammals of North America: Biology, Management, and Conservation*. 2nd ed. Johns Hopkins University Press, Baltimore, USA.
- Best Management Practices [BMP's]. 2014. The Association of Fish and Wildlife Agencies-Furbearer Management. <http://fishwildlife.org/?section=best_management_practices>. Accessed 5 May 2016.
- City of Mequon. 2015. City of Mequon coyote nuisance management and response plan policy. Mequon, WI.
- Craven, S., T. Barnes, and G. Kania. 1998. Towards a professional position on the translocation of problem wildlife. *The Wildlife Society Bulletin* 26: 171-177.
- Gehrt, S. D. 2006. Urban coyote ecology and management: The Cook County, Illinois coyote project. *The Ohio State University Extension Bulletin* 929. Columbus, OH.
- Gehrt, S. D., C. Anchor, and L. A. White. 2009. Home range and landscape use of coyote in a metropolitan landscape: conflict or coexistence? *Journal of Mammalogy* 90(5): 1045-1057.
- Gehrt, S. D. and S. P. D. Riley. 2010. Coyotes (*Canis latrans*). Pages 79-95 in S. D. Gehrt, S. P. D. Riley, and B. L. Cypher, eds. *Urban Carnivores: Ecology, Conflict, and Conservation*. Johns Hopkins University Press, Baltimore, USA.
- Sterling, B., W. Conley, M. Conley. 1983. Simulations of demographic compensation in Coyote Populations. *The Journal of Wildlife Management* 47: 1177-1181.
- Timm, R. M., R. O. Baker, J. R. Bennett, and C. C. Coolahan. 2004. Coyote attacks: an increasing suburban problem. *Transactions of the North American Wildlife and Natural Resources Conference* 69:67-88.
- White, L. A. and S. D. Gehrt. 2009. Coyote Attacks on Humans in the United States and Canada. *Human Dimensions of Wildlife* 14:419-432.

Appendix 11: Contact Info

- Milwaukee County Parks Natural Areas
 - Web: <http://county.milwaukee.gov/Trails8084/NaturalAreas.htm>
 - Phone: 414-257-6100
- Wisconsin DNR
 - Web: <http://dnr.wi.gov/>
 - Phone: 1-888-936-7463 (ask for local county biologist)

Appendix 11: Resolution 15-690

By Supervisor Weishan

File No. 15-690

A RESOLUTION

Appropriating up to \$25,000 from the Appropriation for Contingencies to the Department of Parks, Recreation, and Culture to develop an action plan for mitigating coyote nuisance in Milwaukee County in collaboration with the Wisconsin Department of Natural Resources

WHEREAS, recently there have been multiple reported complaints related to coyotes in the City of Wauwatosa as a result of three separate fatal attacks on local residents' dogs; and

WHEREAS, County residents expressed concerns to the Wisconsin Department of Natural Resources (DNR) requesting a course of action for addressing the growing coyote problem; and

WHEREAS, on October 6, 2015, a public meeting was held with Wauwatosa officials and the DNR to discuss how to combat the coyote issue and keep residents and pets safe; and

WHEREAS, the DNR stated that population control, such as culling, is not an effective method for coyotes, and instead causes a surge in their breeding patterns; and

WHEREAS, the City of Mequon's Common Council adopted a Coyote Nuisance Management and Response Plan Policy on August 11, 2015, to provide a strategic action plan for handling incidents between humans and coyotes, which includes hazing efforts to instill a fear of humans, as well as a removal system conducted by contracted professionals, if necessary; and

WHEREAS, Milwaukee County has a duty to its residents to address the valid safety concerns of their families, pets, and property; now, therefore,

BE IT RESOLVED, that the Director, Department of Parks, Recreation, and Culture is requested to collaborate with the Wisconsin Department of Natural Resources to develop a strategic plan of action to address coyote nuisance within Milwaukee County, and to implement measures that ensure the safety of all residents and their respective property, which may include a removal procedure for patterned coyote nuisance; and

BE IT FURTHER RESOLVED, that the Department of Administrative Services-Office of Performance, Strategy, and Budget is authorized to process an appropriation transfer to appropriate up to \$25,000 from the Appropriation for Contingencies account to the Department of Parks, Recreation, and Culture to be used towards the development of a coyote management plan for the County; and

BE IT FURTHER RESOLVED, that any coyote management plan developed by the Department of Parks, Recreation, and Culture is to be implemented as soon as practicable, beginning with primary emphasis on the Wauwatosa area; and

BE IT FURTHER RESOLVED, that if it is determined that the appropriated \$25,000 is insufficient to cover the costs of the coyote plan development and its implementation, the Department of Parks, Recreation, and Culture may submit a request for an additional appropriation transfer to address the remaining costs for this program.