City of Boulder
Urban Wildlife Management Plan
Black Bear and Mountain Lion Component

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Executive Summary

The City of Boulder has a rich history of natural land protection, beginning with the purchase of 171 acres of mountain backdrop in 1898. Today, the city is surrounded on all sides by 45,000 acres of Open Space and Mountain Parks (OSMP) land with county, state and federally-owned natural lands nearby. All of these areas provide habitat for a number of native wildlife species, including black bear (*Ursus americanus*) and mountain lion (*Puma concolor*). The city also promotes and supports the protection of natural habitat along the numerous greenways and creeks running through town. The connectivity of the natural lands through and around the urban area provides movement corridors and habitat continuity for the many native wildlife species that wander into the city in search of food, water or cover.

Boulder has a long history of ecosystem management that supports wildlife through its OSMP program, but until recently the city has not focused on comprehensive management of wildlife within the urban area. The attitude toward urban wildlife was historically "live and let live" unless conflicts arose between residents and wildlife at which time they were addressed on a case by case basis.

Over the past decade, however, conflicts between wildlife and humans have become more frequent. While residents have learned to tolerate the conflicts posed by some species like raccoons, the presence of other animal species, such as black bears and mountain lions, make co-existence more challenging. In recent years, an increase in lion sightings and concerns expressed by residents, in addition to ongoing presence of bears in residential neighborhoods, have raised the question of whether the city is taking appropriate actions to reduce potential conflicts with these animals.

The **purpose** of the Black Bear and Mountain Lion component of the Urban Wildlife Management Plan (UWMP) is *to develop effective strategies to minimize human/wildlife conflicts and increase public awareness on how to better coexist with these animals.*

The plan **objectives** are to:

- Identify and clarify the role of the city in black bear and mountain lion management;
- Develop strategies to reduce bear attractants in the urban area;
- Increase public awareness of how to minimize conflicts with black bears and mountain lions; and
- Identify costs and prioritize actions for plan implementation.

The City of Boulder and the Colorado Division of Parks and Wildlife (CPW) are partners in reducing potential human-wildlife conflicts. Both organizations play important roles in public education and safety. The distinction between the **roles** of the City of Boulder and that of CPW in wildlife management is important. The CPW is responsible for developing direct handling protocols and procedures, and the management of bears and mountain lions throughout the state, which includes population regulation, removal, relocation, and use of lethal control. The city cannot regulate or affect the use of lethal control, relocation, or direct any form of non-pest wildlife management. The city's role in developing management practices for black bears and mountain lions in the context of this plan involves influencing human behavior or the land uses

that encourage these animals to come into urban areas (e.g. feeding wildlife and trash management).

Black Bear

The City of Boulder has a history of black bears foraging on trash, fruit trees, bird feeders, pet food, and other unintentional attractants in the urban area. These food sources encourage bears to be in town and increase the risk of conflict with humans. Though there are many bear attractants in urban areas, trash is the primary attractant, and the most harmful to the animals. State law and city code prohibit maintaining trash in a way that is accessible to bears. However, these regulations have not eliminated the attractants to bears in the city. Based on data from other communities, it seems that the most effective solution to the problem of bears accessing trash is to increase the use of bear-resistant trash containers. In the case of Boulder, this may be particularly effective in neighborhoods on the western edge of town where bears are entering the city. Since most Boulder residents have three waste containers (for trash, compostables and recyclables), there are three containers serving as potential attractants at every residence.

The city will be addressing the issue of bears accessing trash through an adaptive management approach. Adaptive management is an approach that involves working with the community, monitoring, and proposing next steps based on results. The approach includes a three-year monitoring and evaluation cycle and involves the following steps:

Step 1: Monitor the issue and build community education and awareness (2 years)

Step 2: Evaluate results and success (3rd year)

Step 3: Make changes to approach based on evaluation results. (3rd year)

This approach to addressing the accessibility of trash to black bears recognizes that a new regulation requiring bear-resistant containers may not supported by the community at this time due to increased costs and lack of awareness of the problem or community agreement about the severity of the problem. This will provide the city the opportunity to increase public awareness of urban bear issues and gives residents the opportunity to take voluntary action that could lessen or eliminate bear-trash encounters.

Mountain Lion

Mountain lions have long been spotted within and around Boulder. Though mountain lions tend to be secretive, they are capable of preying on humans. The only reported human attack in Boulder County during the past decade was in 2006 on Flagstaff Mountain, 3.5 miles west of the city. In addition, some residents have expressed concern about a perceived increase in mountain lion activity in recent years. As a result, residents are concerned about their safety, and the safety of their children and pets.

Mountain lions spend most of their time in natural areas, however lions are also opportunistic predators that prey on urban wildlife (e.g., deer, raccoons, fox, coyote) and domestic animals,

such as pets, goats, sheep llamas and chicken. In addition to prey, city neighborhoods provide other necessary resources for lions, including water and shelter.

As managing mountain lion attractants such as the availability of prey, water, and shelter is extremely challenging, staff is proposing focusing efforts on education and increasing public awareness through a **Mountain Lion Awareness Plan**. **The plan objectives are to improve interagency communication; and increase public awareness, understanding and acceptance of personal responsibility.** To achieve these objectives, the plan will:

- Establish protocols for interagency and interdepartmental exchange of lion sighting and management information
- Educate and inform residents about mountain lion activity and behavior and ways to reduce attractive habitat on their property
- Clarify and describe agency roles in lion activity in city limits
- Establish a single contact for city data management and outreach programs
- Establish public access to data on reported activity
- Establish additional outreach for schools and areas where children congregate
- Describe communication protocols for when a lion sighting is reported and confirmed.

Implementation

Due to the city's location and natural surroundings, and the high resident turn-over in the urban interface, education on co-existing with wildlife will be an ongoing activity for the city organization. Specific **action items** include:

- Develop a website to provide public access to data on reported activity and information on behavior of local black bears and mountain lions.
- Establish protocols for interagency and interdepartmental exchange of black bear and mountain lion sighting and management information.
- Continue education and outreach efforts including educational programs, media story placements, printed pamphlets and sign postings.
- Implement monitoring of bear activity related to trash.
- Evaluate community receptivity and economic feasibility of potential policy and program changes by continuing to solicit feedback.

Chapter 1: Introduction

Purpose, Problem Statement, and Objectives

The purpose of the Black Bear and Mountain Lion component of the Urban Wildlife Management Plan (UWMP) is to develop effective strategies to minimize human/wildlife conflicts and increase public awareness on how to better coexist with these animals.

Problem Statement

Black bears and mountain lions tend to avoid humans, though their presence in residential areas is well documented, and the potential for interaction with community members and their pets is a potential threat to human safety. The city has a history of black bears in the urban service area foraging on trash, fruit trees, bird feeders, and other food attractants. Similarly, mountain lions, though generally secretive animals have long utilized the urban service area in their search for resources.

Some residents have expressed concern about a perceived increase in mountain lion activity in recent years. The Colorado Division of Parks and Wildlife (CPW) and other wildlife officials in the Boulder area cannot speculate on the accuracy of these claims as it is difficult to distinguish between improved community communication and reporting about lion activity and an actual increase in activity. There is, however, a clear pattern nation-wide, and over the past two decades, of increased human-mountain lion conflicts.

This increase in lion reports and concerns expressed by residents, in addition to ongoing bear presence in town, have raised the question of whether the city is taking appropriate actions to reduce potential conflicts with these animals.

Human interactions with bears and mountain lions frequently have a negative impact on the individual animal involved. If the CPW determines that an individual bear or mountain lion is a nuisance the animal may be hazed or moved. Animal that are repeatedly a nuisance, or poses a direct threat to public safety, are destroyed. In Boulder CPW destroyed an average of one black bear or mountain lion annually over the past several years, and relocated or negatively conditioned several others because of nuisance behavior or a potential threat to public safety. However, it is not desirable, practical nor feasible to completely eliminate these animals in the urban area. Like all wildlife species, black bears and mountain lions do not recognize city boundaries, and utilize the areas that provide habitat and resources.

The City and the community recognize the intrinsic value of native wildlife in and around the city and view it as one of the positive aspects of living in Boulder. There are, however, tools for reducing the presence of bears and lions in the urban area. By improving community awareness on how to co-exist in bear and mountain lion habitat, the city hopes to support residents in taking action to reduce attractants on their property, and hence minimize the adverse impacts of black bears and mountain lions in the city. This increased awareness in conjunction with human

behavior change (*i.e.*, securing trash from bears) will increase the safety of residents and their pets while promoting the protection of local wildlife.

Objectives

The plan objectives are to:

- Identify and clarify the role of the city in black bear and mountain lion management.
- Develop strategies to reduce bear attractants in the urban area.
- Increase public awareness of how to minimize conflicts with black bears and mountain lions.
- Identify costs and prioritize actions for plan implementation.

Issues

Although black bears and mountain lions are sighted throughout the city, residents living west of Broadway see these animals in their neighborhoods most frequently and are concerned about their personal and pet safety. Black bears typically roam the area searching for food and often get into fruit bearing plants, unsecured waste containers (trash, recycling or composting) along alleys and in people's yards. Mountain lions, too, are often sighted, and their prey caches are found under decks and in dense shrub beds. Over the years, lions have taken pets from backyards or fenced-in areas. In addition, some residents have expressed frustration about not being informed of lion activity near their home or their childrens' schools.

Using information gathered through public meetings and discussions with city residents over the years, staff identified four main issues associated with managing bears and mountain lions in the city. These issues include:

- <u>Inconsistent communication between departments as well as with the public and the CPW</u>
  There is currently no established or consistent protocol for collecting and sharing information about bear and lion activity in the urban area interdepartmentally within the city; between the city and the CPW; and between the city and the public.

- <u>Need for additional on-going public education</u>
  Though the city provides extensive public programs on black bears and mountain lions, there is an additional need for public education about bear and lion behavior, human and pet safety issues, and individual actions to reduce attractants and minimize potential human/wildlife conflicts.

- <u>Insufficient management of trash and other attractants</u>
  Many aspects of the urban environment are inviting to bears, including trash, fruit trees, bird feeders, pet food and apiaries (beehives). The city, however, has not fully developed strategies to directly reduce bear attractants, particularly related to temporary waste storage.

- Feeding wildlife
  Food put out to feed birds, fox, deer or other wildlife can attract bears, or attract prey for mountain lions in the city. Many people are unaware that feeding wildlife (with the exception of birds and squirrels), intentionally or unintentionally, is bad for the animals, against the law, and can increase human/wildlife conflicts.

Relationship to other City Plans

The purpose of the Urban Wildlife Management Plan (UWMP) is to provide guidance and direction for managing wildlife in Boulder. The initial phase of the plan, accepted in 2006, describes the overarching vision and guiding principles for the city's approach to managing urban wildlife. Specific components of the plan outline policies, protocols and actions for managing various species that pose conflicts with humans or human land use. The first component, also accepted in 2006, established guidance for the management of black-tailed prairie dog within the city. The bear and mountain lion management plan is the second species-specific component to the UWMP.

Other plans in the city that inform and relate to the UWMP include:

Boulder Valley Comprehensive Plan
The Boulder Valley Comprehensive Plan provides the general statement of the community's desires for future development and preservation of the Boulder Valley. The BVCP policies guide decisions about the manner in which city services are provided and create the overarching framework for city strategic and master plans. City master plans address policies, priorities, service standards, system needs and funding for the delivery of specific services. The following BVCP policy provides the overall guidance for the Urban Wildlife Management Plan:

> ***3.09 Management of Wildlife-Human Conflicts.***
> *The city recognizes the intrinsic value of wildlife in both the urban and rural setting. The city will promote wildlife and land use management practices to minimize conflicts with residents and urban land uses while identifying, preserving and restoring appropriate habitat for wildlife species in the urban area. When a wildlife species is determined to be a nuisance or a public health hazard, a full range of alternative wildlife and land use management techniques will be considered by the city and county in order to mitigate the problem in a manner that is humane, effective, economical and ecologically responsible.*

Open Space and Mountain Parks Forest Ecosystem Management Plan
Over the past decade, the Open Space and Mountain Parks Department (OSMP) has developed a series of management plans which clarify how the city will manage OSMP properties and provide services, including sustainable natural resource conservation and passive recreation. The city adopted the Forest Ecosystem Management Plan in 1999 to provide specific management direction for Boulder's ponderosa pine forests along the mountain backdrop. A primary goal of the plan is to maintain or enhance native plant and animal species, their communities, and the ecological processes that sustain them.

The plan emphasizes the need to increase public knowledge about wildlife (including black bear and mountain lion) needs in forested landscapes and to continue to ensure that habitat needs are being met. In this respect, the department takes a holistic ecosystem management approach rather than a species-specific approach to wildlife management by assuming that a diversity of habitat types in our local forests will best support a diversity of local wildlife species.

Parks and Recreation Master Plan
One of the Parks and Recreation Department's Master Plan goals is to be a community leader in environmental sustainability. The Parks and Recreation Department (PRD) strives to design parks and facilities by incorporating materials and methods to prevent wildlife encroachment and minimize conflicts. Coordination with planning, public works and other departments to evaluate best management practices in park design and maintenance assists in minimizing conflicts with facility users and wildlife. The PRD recognizes that wildlife use along the urban green corridors and western urban interface often overlap with park and facility sites, and actions to reduce potential conflicts will be addressed through the collaborative efforts defined in the PRD Master Plan.

Zero Waste Master Plan
The Local Environmental Action Division of the city's Community Planning and Sustainability department is in the process of updating the Master Plan for Waste Reduction, originally accepted by City Council in 2006. The update to this plan, now titled the Zero Waste Master Plan, will identify recommended facilities, programs, services and regulatory changes to move Boulder toward its zero waste community goals. Inherent in these recommendations is a drive toward minimizing the amount of trash landfilled, and maximizing the portion of the overall waste stream that is recycled or composted. The trash tax investment philosophy leverages the efforts and resources of private, for-profit and nonprofit organizations and, in its recommendations, aims to balance the community's social, environmental and economic goals.

Community Input and the Planning Process

A public meeting was held in January 2010 to identify issues associated with black bears and mountain lions in the urban service area. From this meeting and input received via the city website, staff developed options for the plan. Public input on policy options was gathered at five "Boulder Matters" events in fall 2010 and through the city's website. Departmental advisory boards provided feedback and a recommendation, and City Council provided direction on options in spring of 2011. See **Appendix A** for planning process chart.

Agency Roles

The City of Boulder and the State of Colorado Division of Parks and Wildlife (CPW) are partners in reducing and managing potential human-wildlife conflicts. Both organizations play

important roles in public education and safety. However, understanding the distinction between the roles of the City of Boulder and that of CPW in wildlife management is important for understanding the tools the city has available to use in minimize potential conflicts between residents and black bears or mountain lions in the city.

The CPW is responsible for the direct handling and management of bears and mountain lions throughout the state, including population regulation, removal, relocation, and use of lethal control. The city cannot regulate or affect the use of lethal control, relocation, or direct any form of non-pest wildlife management. City staff do employ hazing techniques (*e.g.,* shooting a bear in a dumpster with a non-lethal rubber buck shot or bean bag) however, the city's role is primarily focused on influencing human behavior or the land uses that encourage these animals to come into urban areas (*e.g.*, feeding wildlife and trash management**).**

Reports of bear and lion activity in the city are made both directly to the CPW, and to the Boulder Police Department. Typically, if a call is made reporting a black bear or mountain lion in the city, a local officer, (typically an Open Space and Mountain Parks ranger), is requested to respond to the area. Acting as an agent of CPW and with their guidance, city rangers routinely respond to bear or lion reports when state officers are unable to promptly be on the scene.

Chapter 2: Black Bear

Biology, Behavior and Importance

The American black bear (black bear) is the only bear species in Colorado. Black bears are distributed throughout North America, from Canada to Mexico and in at least 40 states in the US. They historically occupied nearly all of the forested regions of North America, but in the US they are now restricted to the forested areas less densely occupied by humans.

The black bear is the smallest of three bear species found in North America. Contrary to its name, it's not unusual for black bears to have brown, cinnamon-colored or even blond fur. They may also have a tan muzzle or white spot on their chest. Bears are Colorado's largest carnivore, with adults generally weighing 200 to 350 pounds (though adult weights can range from 120 to 600 pounds). Black bears measure about three feet high when on all four feet. In general, bears in the eastern United States tend to be larger than western bears, and males are larger than females. In the Boulder area the average weight for an adult female is 175 lbs. and 275 lbs. for males.

The local bear population is active from mid-March to mid-November. During the winter months, bears are typically dormant and do not eat, drink, urinate, or exercise until they emerge from their dens in the spring. When they are active they are omnivorous: their molars are designed for crushing food rather than cutting as with meat-eating carnivores. Their diet is typically determined by seasonal availability of food and includes a wide variety of plant and animal materials. In natural settings, their foods consist of grasses, flowers, fruits, nuts, seeds, honey, insects, and carrion (dead carcasses). They may occasionally kill and eat animals such as fawns or birds. In some cases, livestock such as chickens, geese, sheep and goats have been preyed upon. All of these food sources exist within the city area.

Black bears play an important role in the ecosystem because of their effects on populations of insects and fruits. They help to disperse the seeds of the plants they eat and consume large numbers of colonial insects and moth larvae.

Today, an increasing number of people routinely live and recreate in bear habitat. Inviting food sources associated with humans such as trash and bird seed often offer bears more calories than could be obtained while spending the same amount of time foraging for their natural food sources. The high caloric rewards found in urban areas cause bears to abandon their natural foraging behavior and return to developed areas in search of food.

Analysis

Nature of Conflicts in the City

The city has a history of black bears foraging on trash, fruit trees, bird feeders, pet food, and other unintentional attractants. These food sources encourage bears to be in town and increase the risk of conflict with humans. Some residents feed birds or intentionally put food out for fox or deer, which can unintentionally draw bears into their yards. Many people are unaware that feeding any wild animal (with the exception of birds and squirrels) is bad for the animal, against the law, and potentially dangerous for people in the city. Though black bears tend to be wary of humans, and attacks on humans are extremely rare (there have been no reports of black bear attacks within the city), bears can become habituated to and ultimately may become aggressive towards humans.

Efforts to reduce bear conflicts are intended to protect both people and wildlife. Bear scat in the Boulder area has been found in yards, ditches, alleys, parks, riparian corridors and other locations. It has contained plastic, cellophane, aluminum foil, cigarette butts and other human-generated materials that are ingested when bears feed in trash. Failure to secure trash, leaving piles of trash until pickup day, or overfilling trash receptacles create bear attractants. Bears that access trash often drag and spread household waste on streets, lawns and alleys, compromising basic neighborhood sanitation. Reducing attractants in the city can help minimize harm to the health of bears and humans, and the number of bears that must be destroyed as a result of nuisance activity.

Bear Activity Monitoring

In spring 2009, city staff began consistent monitoring of bear activity within the city limits of Boulder. By collaborating with OSMP and CPW staff, a database of all reported bear activity was developed.

Staff received a total of 208 reports of bear activity in 2009 and 2010. The reports with specific addresses (189 reports) were mapped (see **Appendix B** for 2009 & 2010 bear sighting map), and showed most of the activity occurred in the western, urban interface areas of the city. Sixty percent of the reports (or 124 reports) did not identify associated attractants. However, most reports that do have an associated attractant, identified trash as the attractant (see Tables 1 and 2 below). It is important to note reports of "trash" typically meant the bear was in the brown polycart waste container which may have contained trash, compost or recycling. Very few reports specified compost containers (5) or recycling containers (0), but there may have been more bear activity in those specific types of polycarts that were collectively reported as "trash" or "garbage." Also relevant is that the sighting database does not include all the bear activity that occurred within the city. The information collected is based exclusively on agency reports. It is likely that information based solely on reported incidents greatly underestimates the bear activity in town.

Table 1. *Bear attractants identified for the 82 reports of bear sightings received in 2009 with identified attractant.*

Attractant	Number
Trash	19
Fruit trees	4
Compost	2
Chickens	1
Pet food	1
Car	1
House (siding)	1
Bird feeder	0
Total	**29**

Table 2. *Bear attractants identified for the 126 reports of bear sightings received in 2010 with identified attractant.*

Attractant	Number of reports
Trash	39
Fruit trees	4
Compost	3
Chickens (and Turkey)	1
Pet food	0
Car	1
House (cooking inside)	1
Bird feeder	2
Apiaries	3
Livestock (goat)	1
Total	**55**

Current Approaches to Bear Management

City Law

The current Boulder Revised Code includes some provisions that are intended to manage bear attractants in the city:

- Section 6-3-3 prohibits the accumulation of trash, recyclables, and compostables.
- Section 6-3-5(a)(1) requires that trash, recyclables, and compostables be stored in containers so that it is not overflowing and is not scattered by animals.
- Section 6-3-5(a)(9) prohibits placing trash, recyclables, and compostables out for collection before 5 a.m. on collection day and requires that containers be removed by 9 p.m. the same day. This section includes an exception for public alleys.
- Section 6-3-6 requires compost piles to be maintained in a way that prevents them from becoming a nuisance, including attracting wildlife or other animals.

- Section 6-3-9 requires rental properties in the University Hill and Goss-Grove areas to maintain daily trash service Monday through Saturday during spring and fall periods published by the city.

Violations of these ordinances may result in issuance of a municipal court summons. Section 6-3-8 also provides for administrative remedies, including removal of trash at the property owner's expense plus a $100 administrative fee.

Section 6-1-4 prohibits intentional feeding of wild animals (with a specific exemption related to the feeding of wild squirrels, birds or fish).

State Law

In addition to city ordinances, the CPW can issue a summons to any person for knowingly luring black bears (C.R.S. 33-6-131) or "failing to take appropriate action in securing or removing outdoor trash as to avoid contact or conflict with black bear" (Wildlife Commission Regulation 021(D). Both of these regulations require an initial warning by the officer.

Education and Outreach

Both the CPW and OSMP have education and outreach programs to provide information to residents about co-existing with bears and reducing bear attractants on private property. Both organizations also have volunteers that are called upon to do door-to-door outreach when bears have shown a pattern of spending time in residential areas. OSMP alone makes thousands of contacts every year about bear safety through both its extensive outreach programs and focused educational programs. This has been the case for well over a decade.

OSMP's ongoing education and outreach efforts have encouraged the removal of bear attractants and increased safety. Formal education programs for children (average of 80 programs reaching 3,000 children annually) and adults (average of 4 programs reaching 150 people annually) include information on how to safely co-exist with bears. Additional outreach includes education at the Chautauqua Ranger Cottage, Farmer's Market, and community festivals. Specific programs include: Meadow Music children's concerts, "street performances" of a "Bear Opera" at Colorado University, and a "Wake up the Bear" concert at Downtown Boulder, Inc.'s Tulip Fairy and Elf Parade (2000 people attended).

Voluntary Bear-Resistant Trash Storage

In 2008, the city worked with Western Disposal to allow residents to voluntarily order bear-resistant trash containers. Residents were notified of this change with a letter in their Western Disposal bill in early 2009. The cost for Western Disposal to provide a bear-resistant container is $10 per month in addition to the cost of the regular 64 gallon container[1]. Since that time, a total of 79 containers have been ordered, and are currently being used within the city.

[1] *If a resident is currently using a container smaller than 64 gallon, they would also have to pay for the increased service of a larger cart as bear resistant containers are only currently offered in the 64 gallon size.*

The city has installed and maintains bear-resistant trash containers in the western city-owned parks and trailheads. These areas are easily accessed by bears and securing them has decreased the amount of bear activity in those areas.

Evaluating Boulder's Approach to Waste Management

British Columbia's "Bear Smart" community program has developed a rating system for various waste management practices that could be used to address trash as an attractant for bear. Through their extensive literature review, the organization has identified "The root cause of nuisance activity by black bears is attraction to sources of human food or waste that is easily accessible by bears." Their waste management rating system (see Table 3), recognizes that the most effective way to keep bears out of trash is with the use of communal bear-proof trash containers. In the absence of communal containers, individual home (curbside) trash collection can reduce the lure to a bear by the type of container used and how it is stored. Boulder would be considered below the "Good" rating because bear-resistant storage or containers are not a requirement.

Table 3. *Bear Smart Community rating system for waste management collection systems (from Bear Smart Society: www.bearsmart.com).*

GOOD	BETTER	BEST
Curbside Pickup: Garbage stored indoors until day of pick up, or in bear-resistant containers outdoors - place curbside only on morning of pick-up.	Main bear-proof compactor sites for general use placed strategically at points in community by which residents regularly travel.	100% bear-proof receptacles placed throughout community - one for every 30 homes + bear-proof receptacles for commercial use (incl. garbage, recycling & grease).

Although Boulder requires residents and businesses to secure trash from animals, the law has been difficult to enforce because violations are only investigated when reported, and trash is often visited by bears and scattered in the evening or early morning hours. If an incident is reported, the trash is often cleaned up prior to the arrival of an officer, leaving no evidence of bear activity and thus preventing staff from issuing a warning or summons.

Public awareness of bear conflicts and an understanding of the impact of waste management practices on bear activity play a large role in addressing the problem. Most residents on the western edge of the city are probably aware that bears are present in the area. It is unclear, however, if most residents understand the potentially significant impacts associated with wildlife and bears becoming habituated to eating trash.

Comparison to Other Approaches

Staff compared Boulder's current waste management practices to those in other communities in North America that also identify bear activity as a potential problem in their cities. Of the communities researched, Vail, Aspen, Durango and North Shore, Vancouver provided the most useful information because of recent updates to their regulations and/or their similarity to Boulder (see **Appendix C** for an overview of each of these communities and how they compare to Boulder).

Discussion of Options for Managing Attractants

Trash

The most effective solution to the problem of bears accessing trash and food waste is to increase the use of bear-resistant containers, particularly in neighborhoods throughout the western edge of town. Since the generic term "trash" was used to identify the attractant in 84 of the 208 reports of bear sightings, it is unclear whether it would be necessary to convert the trash, compost and/or recycling collection containers to bear-resistant containers to minimize "trash" as an attractant. The city could take several approaches to managing the accessibility of trash to bears. These approaches range from education about behavior change; education and voluntary purchase of bear-resistant containers; and/or regulation requiring the purchase of bear-resistant containers.

Public input on policy options was gathered at five "Boulder Matters" events in fall 2010 and through the city's website. Based on public comment and input from the CPW, staff developed the following options to address the problem of trash and food waste as a bear attractant.

Option 1: Build community awareness and establish an adaptive management approach based on program evaluation.

Option 2: Require bear-resistant containers on properties where a bear or wild animal has previously accessed trash.

Option 3: Require bear-resistant containers in areas with unsecured trash along western alleys in the western urban interface.

Option 4: Require bear-resistant containers on all properties along most of the western urban interface.

Other Attractants

Within the City of Boulder, a variety of attractants may be responsible for bringing bears into the city, or providing food that encourages bears to continue to feed in the city. In addition to trash and/or composting, fruiting trees and shrubs, apiaries (beehives), chickens and other small livestock, barbeque grills, pet food and bird/squirrel feed may all serve as bear attractants. In addition to these unintentional attractants, illegal feeding of other wildlife may provide food attractive to bears in the urban area. However, trash and compost are responsible for the largest number of reports where attractants were identified. In addition, trash is available more broadly than the other attractants, in larger volumes, and presents a clearer threat to bears within the city. Bears that consume trash may ingest unhealthy materials such as foils and plastic. In addition, modifications to trash storage can be made without conflicting with other city priorities such as local food production.

All of these attractants present a different opportunity for limiting food available to bears in the urban area. Staff has evaluated a variety of strategies to reduce the influence of these attractants. At this time, staff is recommending that efforts focus largely on education with respect to non-trash attractants, with more significant efforts focused on trash and compost and the availability of bear-resistant containers.

Adaptive Management Plan

Adaptive management as applied to this issue is an approach that involves working with the community, monitoring, and proposing next steps based on results. This plan recognizes that a new regulation requiring bear-resistant containers may not be supported by the community at this time due to increased costs, lack of awareness of the problem, and a lack of community consensus about the severity of the problem. However, the plan provides the city the opportunity to increase public awareness of urban bear issues and gives the community opportunities to take voluntary action toward reducing attractants. It also allows for a spectrum of potential outcomes at the end of three years from little or no policy change, to regulations requiring bear-resistant containers.

This plan includes a three-year monitoring and evaluation cycle including the following steps:

Step 1: Build community education and awareness (two years)

- Enhance the city website to provide more information about bear activity and how to reduce attractants and safely live with bears in the city.
- Increase outreach and marketing to residents to participate in a voluntary Bear Aware certification program, and to provide information on living with bears and the availability of bear-resistant trash containers.
- Increase staff monitoring (Urban Wildlife Coordinator) of bear activity related to trash (*i.e.*, morning trash day drive by visits to areas of high bear activity) to supplement resident reports and to try to identify the specific containers that poses the attractant.
- Continue to target education and outreach with use of bear volunteers, based on bear activity.

Step 2: Evaluate success (third year)

- Report on monitoring, number of bears destroyed, areas of high bear activity, number of bear-trash interactions.
- Evaluate need for additional action such as increased use of bear-resistant containers.
- Survey community for support of bear-resistant containers if warranted by bear activity.
- Evaluate community ideas and support for further measures to increase use of bear-resistant containers if deemed necessary.

Step 3: Make changes to approach based on evaluation results. (third year)

- If need is evident and community support for bear-resistant containers is expressed, revisit options.
- If enough community support for requiring bear-resistant containers is expressed, or funding is available to implement a pilot program for bear-resistant containers, return to City Council with updated staff recommendation and options.

Step 4: Repeat

- Continue cycle of monitoring, evaluation, and proposed modifications.

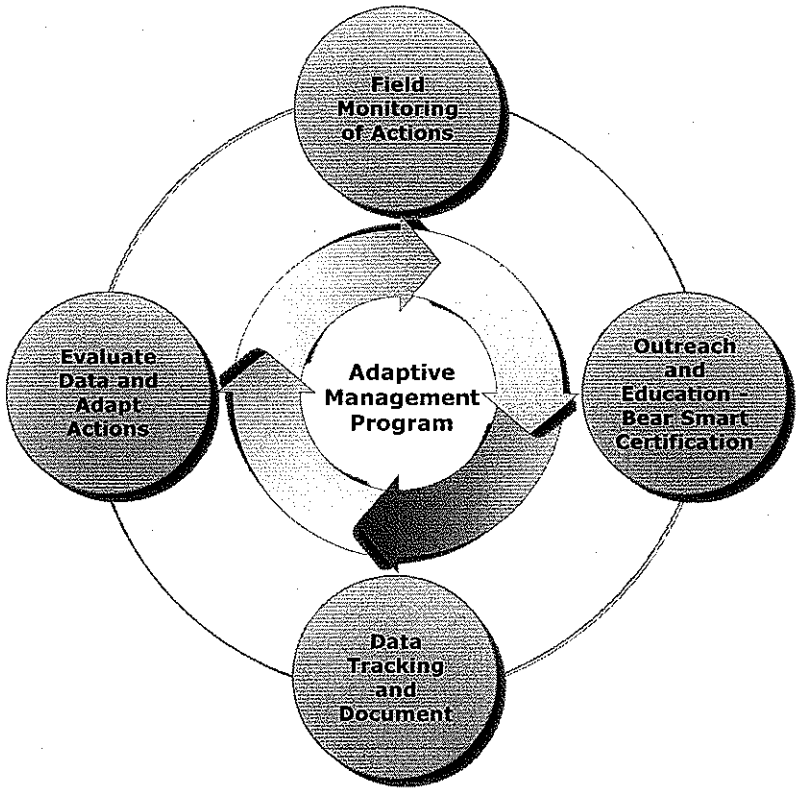


Figure 1. Adaptive Management Diagram

Chapter 3: Mountain Lion

Behavior, Biology and Importance

Mountain lions have the largest geographic range of any native mammal (other than humans) in the Americas, from western Canada to Argentina, and from the Atlantic coast to the Pacific coast. They once ranged throughout the United States, but organized elimination campaigns directed at mountain lions and other large carnivores severely diminished their populations by the early 1900s. In the1970s the mountain lion was declared a game species, providing the first form of protection the species had seen. But as the number of lions being hunted and destroyed was better managed in the 1970s, the animals' available habitat greatly diminished. Mountain lions thrive in large, wild landscapes, which support their large home ranges and the prey that they feed on. Expanding urban populations and land development has increasingly limited the amount of suitable habitat available for lions to use. In the United States today, eastern mountain lion populations are extinct or endangered, but western states such as Colorado support stable populations. It is estimated that approximately 5,000 lions live in Colorado. In Boulder County, mountain lions can be found on terrain with mixed deciduous/coniferous forests, riparian areas and rocky foothills country.

The lion's scientific name, *Puma concolor*, means "cat of one color." In Colorado, mountain lions are usually a tawny to light cinnamon color with black-tipped ears and tail. They vary in size and weight with males averaging 150 pounds and 8 feet in length, while females weigh an average of 90 pounds and may be up to 7 feet long. The mountain lion's long, thick tail, which can measure one-third of its total length, is used for balance while attacking prey and climbing trees. A mountain lion's natural life span is about 12 years in the wild.

A mountain lion's diet consists mainly of deer and elk. They also eat rabbit, squirrel, porcupine, raccoon, skunk and other small mammals. Domestic livestock such as cattle, horses, sheep and llamas as well domestic cats and dogs may also be hunted and consumed. Mountain lions stalk their prey on the ground using available cover and attack with a rush. Lions usually catch only one out of three prey animals that they chase and typically feed on one deer-sized prey animal every 8-10 days. Uneaten parts of a carcass may be covered with pine needles, leaves and other debris for later feeding, which is known as a *cache*. Mountain lions often eat weak or diseased animals and help keep deer populations scattered, preventing overgrazing.

Mountain lion territories vary in size from 10 to 370 square miles, with male mountain lion territories typically being one and a half to three times larger than females' territories. Size of a mountain lion's home range depends on availability of prey and type of terrain. Male territories often overlap several female home ranges. Male territories may include minimal overlap, but males avoid using shared areas at the same time. Boundaries of mountain lion's home ranges are marked with "scrapes": small piles of leaves, pine needles, sticks, stones and other debris soaked in urine used to indicate that the area is occupied.

Mountain lions have proven to be adaptable and commonly live on lands adjacent to cities as long as they have ample prey and cover for resting and hunting. They will also hunt and kill prey in developed areas.

In general, lions are quiet and elusive, preferring to avoid interactions with humans. The private and public lands west of the City of Boulder are ideal mountain lion habitat with adequate cover and abundant deer populations. The number of mountain lion-human interactions in the western United States has increased due to a variety of reasons all of which likely apply in Boulder. More people are moving into lion habitat and the urban interface with lion habitat, which increases the likelihood of interactions. Increase in deer populations and density in some of these same areas provides greater prey opportunities for lions. The increase in people using hiking and running trails in lion habitat also increases the chances of lion-human interactions. Despite the increase in mountain lion sightings and lion-human interactions, attacks by mountain lions remain incredibly rare. In addition, there is no scientific evidence that mountain lion habituation to people in an urban interface area increases the risk of attack.

The risk of negative human-lion interactions increases:

- when mountain lion habitat overlaps residential areas (especially when domestic pets are left outdoors),
- during warmer months when people are more active outdoors, at dawn and dusk when lions are most active, and
- when the following human behaviors/attributes are present: quick movement (people are running/jogging), people are solitary (groups of people are less likely to be attacked than a single person), or small stature (small people/young children are more likely to be interpreted as prey).

Analysis

Nature of Conflicts in the City

The primary food source for mountain lions in the Boulder area is mule deer, which are commonly found throughout the city. Mountain lions spend most of their time in natural areas, however lions are also opportunistic predators that prey on urban wildlife (*i.e.* raccoons, fox, coyote) and domestic animals such as pets, goats, llamas and chickens. In addition to prey, the city provides other necessary resources for lions including water and shelter.

Mountain lions have long been spotted within and around Boulder. The only reported human attack in Boulder County during the past decade was in 2006 on Flagstaff Mountain, 3.5 miles west of the city. In addition to the Flagstaff incident, some residents have expressed concern about a perceived increase in mountain lion activity in recent years. The CPW and other wildlife officials in the Boulder area can not evaluate the validity of claims of increased lion presence as it is difficult to distinguish between improved reporting or an actual increase in lion activity. There is, however, a clear pattern nation-wide, and over the past two decades, of increased human-mountain lion conflicts.

Although human-mountain lion encounters have increased in the western states of their range in recent years, attacks on humans are extremely rare. Though mountain lions tend to be secretive and avoid humans, they are capable of preying on humans. As a result, residents are concerned about their safety, and the safety of their children and pets.

Lion Activity Monitoring

In spring 2009, city staff began consistent monitoring of mountain lion reports within the city limits of Boulder. By collaborating with the OSMP and CPW staff, a database of all reported mountain lion activity was developed, and sightings were mapped (see Appendix D for 2009 & 2010 mountain lion sighting map). The CPW is also currently conducting research on mountain lion activity in the urban interface.

Current Practices

Current Protocol for Responding to Urban Lion Sightings
Lion sightings or activity reported within the city are responded to by an officer (with the exception of "cold" reports of events already passed). The officer can be from the CPW, Boulder Police Department, or OSMP. The action taken to manage the lion may include hazing, relocating, or destroying. It may also involve removing lion caches. The specific actions taken are dependent on a variety of factors evaluated by the CPW, including the lion's behavior and location.

Current Protocol for Communicating Mountain Lion Activity to the Public
Most of the communication and information about urban lion activity is provided to residents by the CPW.

What the CPW currently does:

- Provides information on how to reduce attractants and use deterrent methods those who report lion activity.
- May post signs in area of confirmed activity.
- May contact adjacent land owners to notify of confirmed activity.
- Informally provides information on ongoing lion activity, when possible, to residents via email lists and notifications to schools.
- Collaborates with city staff to present educational programming on mountain lions.

What the city currently does:

- Maintains a database on lion activity in the city. Central information point is available when public questions arise on activity history.
- City rangers may assist the CPW in notifying adjacent residents of lion activity.
- Provides educational programs related to lions through city staff and volunteers.

What could we be doing better?
There is not a formal, consistent communication mechanism to inform the public about lion activity. The city also needs to be proactive in exchanging information with the CPW so as to better provide information to city residents and improve local knowledge of mountain lion behavior.

Mountain Lion Awareness Plan

As managing lion attractants or prey is extremely challenging (see **Appendix E** for a discussion of management strategies), staff is proposing to focus efforts on education and public awareness through a Mountain Lion Awareness Plan. Information regarding the risk of mountain lion interactions, how to avoid attracting lions to the urban area, and how to behave when interactions occur is critical to addressing the concerns and safety of Boulder citizens. To improve interagency communication and increase public awareness, understanding and acceptance of personal responsibility, the plan's objectives are to:

- Establish protocols for interagency and interdepartmental exchange of lion sighting and management information
- Educate and inform residents about mountain lion activity and behavior and ways to reduce attractive habitat on their property on a yearly basis
- Clarify and describe agency roles in lion activity in city limits
- Establish single contact for city data management and tracking outreach programs
- Establish public access to data on reported activity
- Establish additional outreach for schools and areas where children congregate
- Educate the public on the most effective way to notify agencies of lion activity
- Describe communication protocols for when a lion sighting is reported and confirmed.

Knowing how to avoid and deal with encounters is beneficial to the well-being of the community. Using a variety of resources, the city will create a comprehensive guide to mountain lion awareness. By being informed, individuals can make smart decisions that will help keep them and their families safe at home and while enjoying use of city lands. The project is not intended as a "warning," but rather a learning opportunity through which everyone can feel more secure.

Stressing awareness and personal responsibility is critical. A successful campaign would include defining and reaching the target audiences, informing them how mountain lion awareness is relevant to them, and communicating the city's involvement in wildlife safety and information. If appropriate, desired responses to the education campaigns, such as increased awareness and behavior change can be measured through questionnaires, surveys and open house meetings to assess the plan's effectiveness.

<u>Key messages</u>
Boulder is in mountain lion habitat. Therefore, residents must practice behaviors that accommodate co-existence.

1. Individuals must exercise personal responsibility by learning about mountain lion behavior, safety precautions, know the reporting protocol, and have readily accessible Colorado Division of Parks &Wildlife, the Boulder Police Department, the Boulder County Sheriff's Office and the City of Boulder's Open Space and Mountain Parks (OSMP) Department.
2. For citizens concerned about issues with lions, there are strategies for preventing mountain lion confrontations in rural and urban settings. These include avoiding outside

activities during peak lion activity times (dusk and dawn), keeping close watch over children and pets when outdoors.

3. Citizens interested in reducing the chance that they could encounter a lion on their property can change landscaping to remove attractive resting and hunting areas, remove any attractants that may be drawing potential lion prey (deer) to their property, remove water features, install motion sensor lights, and keep homes non-penetrable to large animals.
4. If an individual does come into contact with a mountain lion, there are ways to decrease the potential for a negative interaction. One should not approach the animal, but stop and back away slowly, make oneself appear as physically large as possible, and talk to the mountain lion in a firm voice. If a lion does attack, fight back and try to protect your face and neck.

Media and information channels

The city will use an integrated approach of public relations, media relations, and low cost marketing techniques to educate and inform the public about co-existing with mountain lions. Current practices include:

- Education programs for adults and children that include information about lion and how to coexist (OSMP).
  - Targeted programs for third graders who study wildlife in their curriculum and who are likely to be inspired and able to bring this information back to their parents and families.
  - Children's programs with a lion component: average of 68 programs reaching over 2,300 children annually
  - Adult programs: 6 annually reaching approximately 300 people annually
- Media story placements include information on how to live with bears and lions and reduce potential conflicts (Urban Wildlife Coordinator UWC). Recent examples invlude:
  - Channel 8 A Boulder View interview with UWC titled *Black Bears and Mountain Lions* (May 2011 episode: www.bouldercolorado.gov/index.php?option=com_content&view=article&id=12420&Itemid=4278)
  - Channel 8 Inside Boulder interview with UWC and CPW titled *Wildlife and People* (April 9, 2010 episode)
  - Channel 8 The Moment Episode 2: Environmental Moment, Living with Urban Wildlife (2009: http://www.bouldercolorado.gov/index.php?option=com_content&view=article&id=10967&Itemid=3656)
  - City of Boulder Community Newsletter article titled *Be mountain lion and bear aware in Boulder* (Fall 2009)
- Printed pamphlets provided at Ranger cottage, Open Space and Mountain Parks (OSMP)office and in some programs (OSMP)
- Public relations activities including one-on-one meetings and group communications (CPW, OSMP, UWC)
- Outreach at Farmer's Market booth and Rangers Cottage that provides information about lions, reaching an estimated at 15,000 contacts annually (OSMP)
- Educational signage at trailheads (OSMP)

Chapter 4: Black Bear and Mountain Lion Component Implementation

The objectives of the Black Bear and Mountain Lion component of the Urban Wildlife Management Plan (UWMP) are to promote the protection of our local wildlife, and increase the safety of residents and their pets through improved community awareness and reduced attractants, where feasible.

This plan recommends three ways to reduce attractants and increase public awareness. They are: 1) Education and Communication Practices, 2) Interdepartmental and Intergovernmental Coordination, and 3) City Procedures and Regulations.

Education and Communication Practices

Knowing how to avoid and deal with black bear and mountain lion encounters, in addition to understanding their behavior and activity is beneficial to the well-being of the community. Using a variety of resources, the city will use an integrated approach of public relations, media relations, and low cost marketing techniques to enhance education efforts to inform the public about co-existing with black bears and mountain lions. Stressing awareness and personal responsibility is critical. A successful campaign would include reaching the target audience, informing them how black bear and mountain lion awareness fits into their own lives and communicating to them the city's involvement in wildlife safety and information.

Action item: Develop a website to provide public access to data on reported activity and information on local black bear and mountain lion behavior.

Action item: Enhance current education and outreach efforts which include educational programs, media story placements, printed pamphlets and sign postings.

Interdepartmental and Intergovernmental Coordination

Reports of wildlife activity in the city are received by city departments and the Colorado Division of Parks and Wildlife. Understanding black bear and mountain lion activity in the city must include a way to consistently collect reports of wildlife activity and management outcomes.

Action item: Establish protocols for interagency and interdepartmental exchange of black bear and mountain lion sighting and management information.

City Procedures, Policy and Regulation Development

Much of the bear activity in the city goes unreported, and many of the reports do not include information about what attracted the bear into the area. Having additional information about what bears are doing in the city and where they are is beneficial in developing long-term strategies to reduce urban attractants. For that reason, additional monitoring will be included in the implementation of the plan. The monitoring will supplement the information gathered from sighting reports.

Action Item: Implement monitoring of bear activity related to trash.

The monitoring will include weekly or bimonthly early morning visits to high activity areas to check for evidence of bear visits to trash receptacles. Monitoring of bear activity will provide additional information on how common and widespread bears accessing trash is in neighborhoods. It will also better distinguish activity in waste polycarts from the generic term of "trash," helping to differentiate actual trash containers from compost and/or recycling collection containers. This additional information will help inform management plan updates.

Action Item: Use information gathered in bear activity monitoring to inform Zero Waste Master Plan update policy decisions.

Action Item: Evaluate community receptivity and economic feasibility of policy change by soliciting feedback.

Urban Wildlife Management Plan Black Bear and Mountain Lion Component Implementation Chart

Category	Fiscally Constrained Funding Level (current staff resources)	Action Plan Funding Level	Vision Plan Funding Level
EDUCATION AND COMMUNICATION	• Enhance the city website to improve organization and interface of additional information including: black bear and mountain lion activity, reducing attractants, co-existing with these animals, and clarification of agency response and protocols (CP&S). • Continue outreach and marketing to residents with some new techniques (for example: voluntary Bear Aware certification program), with current resources to provide information on living with bears and the availability of bear-resistant trash containers (OSMP; CP&S). • Continue to target education and outreach with use of "Bear Care" volunteers, based on bear activity (OSMP).	• Enhance outreach and Marketing with educational materials ($5,000 CP&S).	• Develop interactive web tools that represent black bear and mountain lion activity, patterns and statistics. ($15,000) • Develop a comprehensive education program, involving best available educational tools for diverse targeted audiences (non-English speaking residents, college students, youth etc.), and hire seasonal staff to help implement the program ($20,000 and additional staff resources). • Enhance use of "Bear Care" volunteers, by hiring staff to build a stronger volunteer program with increased training, responsibility and incentives for volunteers (one additional seasonal staff Feb-Nov)

Category	Fiscally Constrained Funding Level (current staff resources)	Action Plan Funding Level	Vision Plan Funding Level
INTERDEPARTMENTAL AND INTERGOVERNMENTAL COORDINATION	• Develop a method for centralized data tracking for black bear and mountain lion reports that are received by Boulder PD, Boulder Animal Control, Open Space and Mountain Parks, and the Colorado Division of Wildlife (CP&S).		
CITY PROCEDURE or REGULATION DEVELOPMENT	• Develop and implement a two year monitoring program of black bear activity and attractants in high activity areas to supplement resident reports (CP&S). • Solicit feedback from community on support for bear resistant containers and additional measures to reduce trash as an attractant (CP&S). • Evaluate need and support for additional policy and code changes (CP&S).	• Increase frequency and area of data collection over the next two years (additional staff resources). • Develop on-line survey ($5,000 CP&S).	• Design and implement an on-going systematic monitoring program for bear activity in the western urban interface ($20,000). • Design and conduct full representative community survey ($20,000). • Enhance code enforcement of current trash violations by hiring staff dedicated to trash storage and wildlife (additional code enforcement staff).

Planning Process for the Bear and Mountain Lion Component of the Urban Wildlife Management Plan

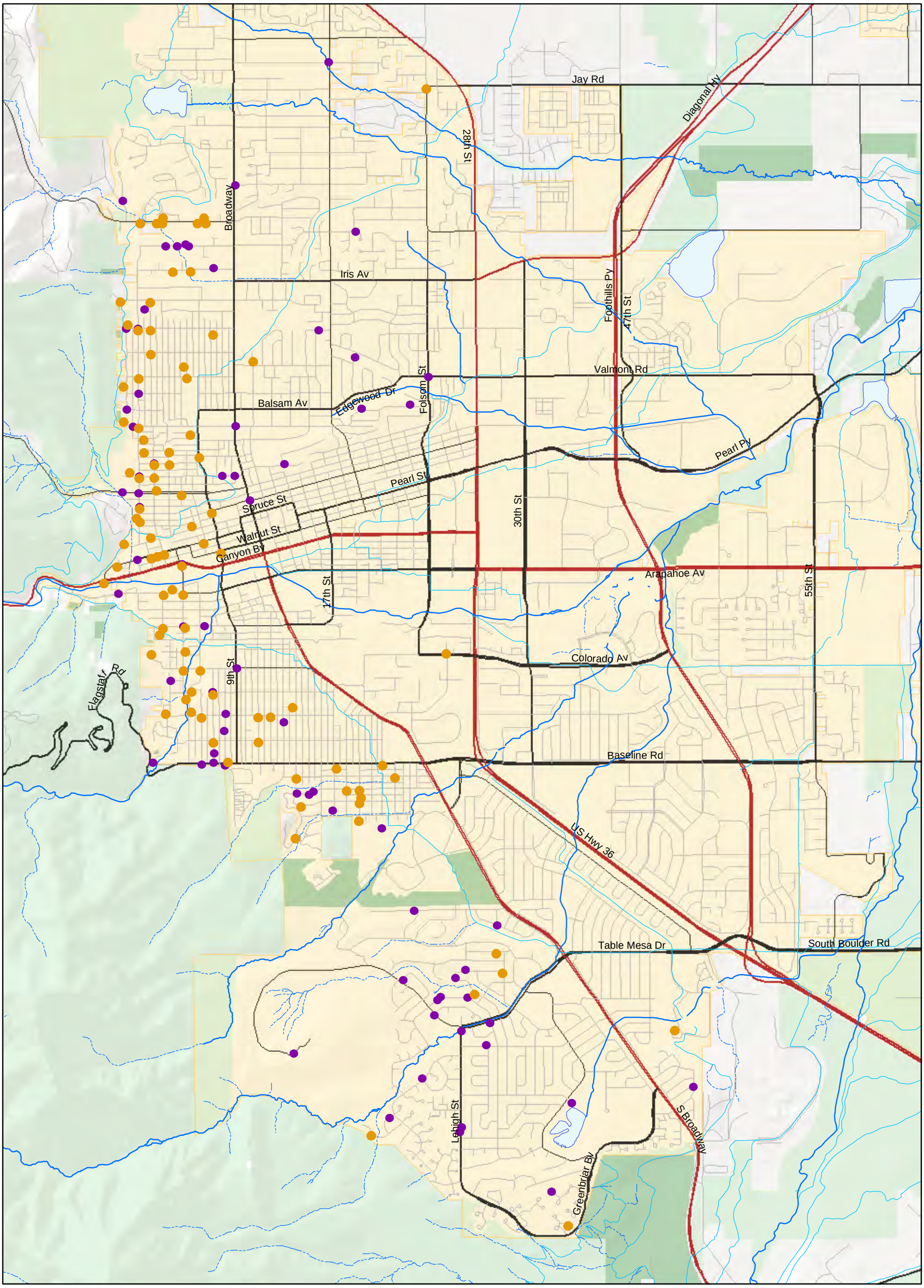
Phase I	Phase II	Phase III
ISSUE IDENTIFICATION AND PROJECT PLANNING November 2009 – February 2010	**ANALYSIS** March 2010 – April 2011	**DRAFT AND FINAL PLAN** May 2011 – October 2011
Staff work group develops preliminary purpose, objectives and issues problem statement and goals	**Staff develops draft policy options and analysis**	**Draft plan**
Public meeting on issue identification (January 20, 2010)	**"Boulder Matters" public meetings on policy options** **"Are these the right options?"** **"What is the preferred option?"** (Fall 2010)	**Public open house on draft plan** (September 14, 2011)
City Council Study Session (February 23, 2010)	**Refine policy options** **Develop recommendation**	**Final plan**
Finalize purpose and objectives	**Board input on policy options and analysis** • **EAB*** • **OSBT**** • **PRAB***** **"Are these the right options?"** **"What is the preferred option?"**	**City Council review and acceptance** (October 18, 2011)
	Refine policy options	
	City Council public hearing on policy options **Direction on preferred options** (April 5, 2011)	

Revised September 2, 2011

***EAB (Environmental Advisory Board)**
****OSBT (Open Space Board of Trustees)**
*****PRAB (Parks and Recreation Advisory Board)**

Reported Bear Sightings 2009 - 2010

Within City of Boulder Limits



Sightings by Year
- 2009
- 2010

Creek
Creek, Intermittent
Ditch

Major Lakes
City Limits
Open Space and Mountain Parks Property
Conservation Easement
Fee Property
Miscellaneous Easement

Alley
Highway
Local Street
Major Road
Minor Road

0 0.25 0.5 Miles

Urban Wildlife Management Plan

Appendix C

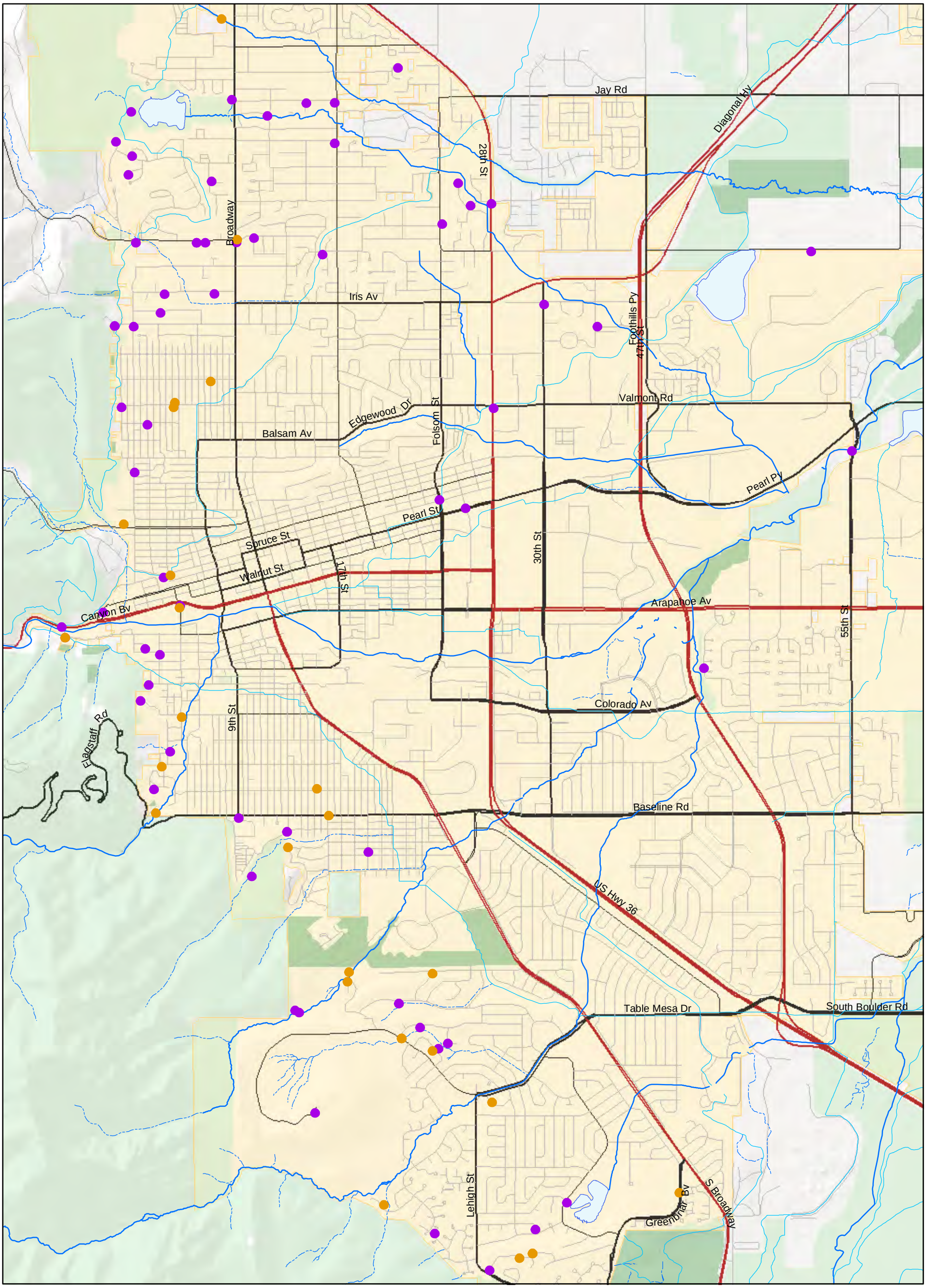
Comparison to Other Community Approaches to Trash Storage

	Boulder, CO	N. Shore Vancouver, BC	Durango, CO	Aspen, CO	Vail, CO
Population	103,000	120,000	16,000	6,000	5,000
No. of Reported Sightings	82 (2009)	591 (2005)	627 (2009)	713 (2009)	222 (2009)
Trash storage law updated	2008	1997	2010	2010	2007
Trash storage requirements	Trash, recyclables and compostables must be stored in a manner so that their contents cannot be scattered by animals and must be set out on trash day between 5:00 am and 9:00 pm (except alleys).	Garbage must be safely stored so that it is not accessible to wildlife. Garbage can only be put curbside on trash day, after 5:30 am.	If trash is confirmed to be scattered by wildlife, then a bear resistant waste container is required and restrictions are placed on the time when containers may be left out (container is not locked when put out for trash pick up).	Trash placed outside must be wildlife-resistant or wildlife-proof and may only be on curb between 6 am and 7 pm on trash pickup day. Refuse container client identification required	Trash (if it contains any attractants) must be in wildlife-resistant or wildlife-proof trash can. May only be on curb between 6 am and 7pm on trash pickup day.

Reported Mountain Lion Sightings 2009 - 2010

Appendix D

Within City of Boulder Limits



Sightings by Year
- 2009
- 2010

Creek
Creek, Intermittent
Ditch

Major Lakes
City Limits
Open Space and Mountain Parks Property
Conservation Easement
Fee Property
Miscellaneous Easement

Alley
Highway
Local Street
Major Road
Minor Road

0 0.25 0.5 Miles

Urban Wildlife Management Plan

Appendix E

Discussion of Mountain Lion Management Strategies

Several options for reducing attractants were evaluated. However, possible approaches to reducing mountain lion attractants in the city are controversial and not largely supported by the community. Future information gleaned from the CPW research project may provide additional insights and tools for lion management in Boulder.

1) Prey Control/Reduction

Options for urban deer population management through hunting or culling conflicts with the community value of protecting native wildlife. Culling the urban deer population has been suggested and explored by other communities including Craig, Colorado. City of Craig staff found a lack of public support for culling and did not pursue this option. Relocation of deer has also been suggested by community members as a way to reduce urban deer populations. This option is not feasible due to the Boulder deer population's high prevalence of Chronic Wasting Disease. The prevalence of the disease makes the local deer population unsuitable to be moved to other areas. In addition, both options are costly, and would require some form of ongoing year-to-year effort to be a successful population control method. Birth control for deer, though currently not available, may be a possibility in the future, but is also likely to have challenges and limitations. It is also important to note that none of these population control measures would prevent deer from migrating into the city. While continuing to explore and evaluate urban deer management options is valuable, it is important to recognize that Boulder's location and land uses provide habitat for deer, and they are likely to remain in town and act as attractants for lions.

Restrictions could be placed on unattended pets that are prey to mountain lions (e.g. requiring dogs to be in covered dog runs when unattended on private property). However, community feedback suggests that this type of regulation is perceived as overly restrictive. Similarly, additional regulation of livestock is not favored by community members.

2) Attractant Reduction

While landscaping and water features can attract mountain lions or their prey, defining regulations to reduce this would be difficult and unlikely to succeed. Community support for additional regulation of landscaping for this purpose is low.

3) Removal and Exclusion

There is no feasible way to keep lions out of the City of Boulder. When appropriate, CPW officers will attempt to capture lions either by tranquilizing them with a dart gun, using a baited trap, or using other techniques. When a mountain lion is relocated two outcomes are possible: either the relocated lion returns to its former range, or a different lion moves into the vacated territory which may include a portion of the City of Boulder. Additionally, lions can jump over very high fences and there are no proven techniques to exclude mountain lions from large areas like the City of Boulder.

Comments Received on the Draft Black Bear and Mountain Lion Component of the Urban Wildlife Management Plan

From: Megan Wilder [ ]
Sent: Tuesday, Septcmber 13, 2011 9:58 AM
To: Matheson, Valerie
Subject: bears and mountain lions

Hi Val- we saw the article in the Camera and think it is high time that Boulder requires the use of bear resistant trash cans. Everyone west of Broadway should be issued these. Most residents would be happy to be assessed the extra cost of these containers if it meant not cleaning up spilled trash and having to destroy nuisance bears.

We live on Knollwood Drive in Boulder and frequently have bears in our yard. We have never reported these signtings because they are just so common. I know most of my neighbors are the same way and think that the statistics that your department are relying on are artificially low.

There is no need for 2 more years of study for this- everyone has know of this problem for years, just implement the solution. The alleys near 4th street are a joke- why let residents keep their trash outdoors day-in-day-out like that?!

We have an apple tree in our yard that attracts the bears, but as you can see below, they also like to play on our slackline. (We have a motion activated camera that took these pictures over the last week or so. Also, this year a mountain lion killed a deer in our yard.) We were visiting Vancouver and Squamish Canada last week and found their awareness and respect for the bears commendable. All the houses in the neighborhoods that we stayed in had bear resistant trash cans and all of the city trash cans were bear proof and had 3 kinds of recycling built in.

Why isn't the most progressive city in the US able to do this?! Please- no more study, just start distributing the bear resistant trash cans!!! Megan Wilder

City of Boulder

Bear and Mountain Lion Component of the Urban Wildlife Management Plan Open House September 14, 2011

Urban Wildlife Management Plan

Comment Form

Do you have any comments on the draft plan?

I think that bear proof cans should be mandatory in areas where there are bears. This is a huge problem in the Mapleton Hill area and it is irresponsible to continue to "invite" wildlife into the community

Web site: boulderwildlifeplan.net

Please leave this comment form at the welcome table.
You may also send your comments by e-mail to mathesonv@bouldercolorado.gov or mail to the City of Boulder, Comprehensive Planning Division, c/o Val Matheson, P.O. Box 791, Boulder, CO 80306.

Name Mona Esposito
Street Address, Zip
Phone
E-mail

Please feel free to use the back of this form for additional comments.

Cougars on the Edge

TRACKING MOUNTAIN LION BEHAVIOR AT THE URBAN-WILDLAND INTERFACE

By Mathew W. Alldredge

Credit: Colorado DOW

Mathew W. Alldredge, Ph.D., is a Wildlife Researcher for the Colorado Division of Wildlife in Fort Collins, Colorado.

A rainy Thursday morning this past May began like any other for most residents of Fort Collins, Colorado. People settled into work, enjoying their coffee, while kids daydreamed about recess as their teachers began to outline the plans for the day.

At 8:30 a.m., the peaceful morning erupted into chaos when Fort Collins police notified the community that a cougar was sighted in the 1400 block of Maple Street, not far from where one had been spotted just two days earlier. Two city elementary schools went on lockdown as wildlife officers combed the area for the cougar without success. Residents were advised to "proceed with extreme caution." The cougar was not found.

Similar scenes have played out with increasing frequency across the western United States, where sprawling human populations mean that cougars (*Puma concolor*)—also known as mountain lions, catamounts, panthers, or pumas—are finding themselves stuck on the edge between natural habitats and human-dominated landscapes, and caught in the nexus between cougar conservation and public safety. Exurban areas and even some urban areas, inhabited by wildlife-loving residents and their carefully tended lawns and gardens, attract ungulates and other cougar prey. Predator populations inevitably follow.

Credit: Colorado DOW

Treed by hounds in Boulder County, a young female cougar takes a rest. Cougars have proven adept at finding their way into urban and suburban areas, stirring up controversy over how to manage them. Opinions may range from "leave them alone" to "kill every one."

The resulting human-cougar interactions can range from a mere sighting to the killing of a pet to—far more rarely—an attack on a human, and such situations cause conflict, raise fears, and challenge managers. That's why my colleagues and I at the Colorado Division of Wildlife (CDOW) are engaged in multi-year studies of cougar populations, tracking individual animals as they make use of developed and undeveloped landscapes, and monitoring their responses to management techniques like translocation and aversive conditioning. We're hoping that better information about cougar habits and responses to management will enable us to both conserve cougar populations and maintain human safety.

Setting the Stage for Conflict

Cougars once occupied a range in the Western Hemisphere larger than that of any terrestrial mammal (other than humans) since the Pleistocene (Rabinowitz 2010). Highly adaptable, cougars inhabited deserts, grasslands, tropical rainforests, temperate mountains, and boreal forests. After Europeans settled North America, however, they virtually eliminated eastern cougar populations and dramatically reduced western populations in an effort to protect livestock and valued game species, and also to protect themselves. Later, government-funded control and bounty programs, along with widespread unregulated killing of predators in the late 1800s and early 1900s, contributed to further cougar population declines.

Beginning in the 1960s, cougar killing was regulated in most of North America and cougar populations throughout much of the West began to increase.

Today, most western states and provinces report stable or increasing populations, even in habitats that adjoin major urban and metropolitan areas (Cougar Network).

As cougar populations have rebounded over the last 40 to 50 years, human populations have grown apace. Throughout the western states, urban populations have expanded into foothills, canyons, and mountains—the same areas where cougars are re-establishing populations. Humans are often drawn to rural and exurban communities because of a desire to be closer to nature and to see and interact with wildlife, but that sentiment can change once they encounter a cougar on their own streets.

These exurban dwellers alter the environment in other ways that can lead to negative human-cougar interactions. Their pets, from a cougar's perspective, may be construed as alternative prey, or even competition if a dog happens upon a cougar's prey cache. Additionally, due to private property rights and constraints on access, sport-hunting opportunities in residentially developed areas are typically limited, allowing prey populations to flourish. Likewise, there is little hunting-caused mortality on urban cougar populations, allowing these populations to expand.

In response to the onslaught of human development, many state, county, and city governments in the West have purchased land to manage for wildlife. These parcels, combined with the huge tracts of public land managed by the U.S. Forest Service (USFS), Bureau of Land Management (BLM), U.S. Fish and Wildlife Service, the National Park Service, and privately-owned ranching properties, provide extensive, connected habitat for wildlife. As wide-ranging species like cougars—which can have territories of greater than 100 square miles—explore the borders of these protected habitats, they are increasingly living in human-dominated landscapes.

Management in the Middle

With more people in wildlife habitat, expanding cougar populations, limited hunting, ample wild and domestic prey, and potential competition over resources, the stage is set for conflict. It's therefore no surprise that, over the last few decades, wildlife agencies in the West have been dealing with an ever-increasing number of cougar incidents in urban and exurban areas. When responding to a sighting or complaint, wildlife officers have been known to find a house cat or dog mistaken for a cougar, a cougar statue, a cached prey item, a cougar track, or even a cougar warming itself on the cover of a resident's back-porch hot tub.

Credit: Colorado DOW

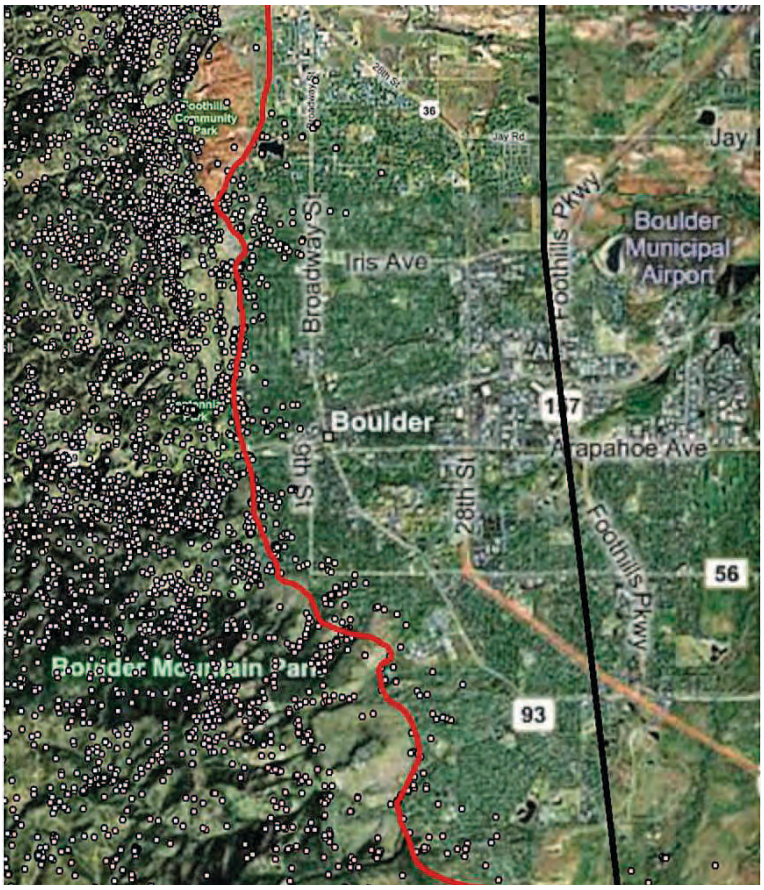
Researchers with the Colorado Division of Wildlife outfit a sedated male cougar caught in Boulder County with a GPS collar. Information gleaned from tracking this and other cats has indicated that, while some individual animals make use of urban areas, most go out of their way to avoid human activity.

Much rarer are reports of cougars attacking people. From 1890 to 2008, there were 21 confirmed fatal cougar attacks and 154 confirmed non-fatal attacks (Cougar Info 2009). But the risk of an attack is growing for individuals who live or recreate in cougar habitat: The number of attacks on humans in the U.S. and Canada increased nearly five-fold from the 1970s to the 1990s, with 14 fatal attacks and 64 non-fatal attacks occurring in that time period (Mattson *et al.* 2011).

When a complaint about a cougar is found to be legitimate, a responding wildlife officer must determine the best course of action, factoring in the type of interaction (nuisance, depredating, or dangerous), cougar behavior, cougar status (age, sex, and health), cougar history (first time offense versus repeat behavior), location (densely populated versus rural), and public safety. Based on this assessment, and taking into consideration conservation of cougar populations, the officer may choose one or more of the following responses:

- No action toward the cougar, but provide educational materials or in-person visits to the reporting party and community as appropriate.

Go to www.wildlife.org to get information about *Managing Cougars in North America*, a new book written by leading cougar researchers and published by the Western Association of Fish and Wildlife Agencies and the Berryman Institute.



Credit: Colorado DOW

Credit: Colorado DOW

The GPS locations of collared cougars near the city of Boulder, Colorado (left), indicate that they prefer to stay outside city limits. But when city residents spot a cougar or evidence of one, such as a deer carcass cached in a homeowner's carport (above), the predators can sometimes feel too close for comfort.

- Deterrent methods (such as fencing), combined with education efforts.
- Aversive conditioning of cougar (non-lethal projectiles, pepper spray, or hounds) combined with education efforts.
- Capture (through immobilization or trapping) and relocation of the cougar.
- Killing the cougar.

Picking the "best" path isn't easy, especially since dealing with the human side of the equation is half the battle. Public sentiment runs the gamut from "the cougars were here first, so leave them alone" to "get rid of all of them because it is only a matter of time before they kill someone." Defining acceptable levels of human safety is extremely difficult. In a 2005 public opinion survey in Colorado, 56 percent of respondents felt it was highly to moderately acceptable to destroy a cougar that attacks and injures or kills a person who is recreating in cougar habitat, 36 percent felt that eliminating the cougar was only slightly acceptable or unacceptable, and 8 percent were unsure (CDOW 2006, unpublished data). Of course, opinions change when the person is actually involved in an incident with a cougar.

In addition, there is limited information available regarding how cougars use urban and exurban habitats and how they respond to management prescriptions (CMGWG 2005). For instance, there are conflicting opinions and evidence as to whether cougars in developed areas become habituated to humans, human activities, and urban landscapes or are just utilizing these areas opportunistically and generally avoiding humans. Understanding this simple dichotomy can significantly affect management decisions. While a habituated cougar would be a candidate for relocation or removal, the opportunistic cougar may not justify such a response because it likely will not be seen in the area again. To attempt to get a better understanding of how cougars interact with humans, use urban and exurban areas, and respond to management practices, CDOW—as well as many other western state agencies—have embarked upon research projects in and around the urban-wildland interface.

Tracking Cougars

In one such project, we have spent the last five years conducting an ongoing fine-scale study of 62 GPS-collared cougars living along the northern Front Range of Colorado, an area with a significant and

growing human population. Specifically, we've focused on Boulder, a city with a population of roughly 100,000, up from 77,000 just 30 years ago. The town's western edge traverses prime cougar habitat with a large population of ungulates such as elk and mule deer—prime cougar prey. The surrounding area contains small mountain communities, scattered housing developments, small ranches, and lands owned by local governments, the USFS, and the BLM. Each year CDOW responds to a large and increasing number of cougar incidents from Boulder and the surrounding area, ranging from sightings and prey caches to more aggressive encounters.

As part of our study, we record the collared cougars' positions seven or eight times a day. Some of our best data has come from six adult females that include the city of Boulder in their home ranges. All six have interacted with humans in some way within city limits and have been reported by the public: Either they've been seen by a resident or they've cached a deer or raccoon carcass in a populated area.

Wildlife officers respond differently to these interactions, depending on their nature and frequency. Two of the six cougars entered Boulder only once and were captured and translocated up to 100 miles outside of the city. Two others entered the city occasionally, and even killed deer within the city limits, but were not translocated, primarily because interactions with these two cougars generally involved periods when they had older cubs that were utilizing small prey items, such as raccoons or house cats. The remaining two cougars entered the city more often: Up to 6.5 percent of their GPS locations were within city limits. These two were euthanized because of repeated sightings in town. Based on our GPS data, however, cougar use of lands within city limits was minimal, despite the large numbers of deer and other prey available in Boulder. In fact, our analysis indicates that they use privately owned land less than we would expect based on its availability (see map on page 74). For the four infrequently visiting cougars, the more tolerant, non-lethal management actions appear to be justified.

Clearly, cougars use human-dominated landscapes. But our study indicates that, at a fine scale, the cats seem to avoid centers of human activity in both space and time. Even as cougars travel and hunt in the urban-exurban landscape, they seek areas farthest from human structures or activities. Researchers in California and Washington have demonstrated similar patterns (Burdett *et al.* 2010, Kertson 2010). In Colorado, we've frequently found cougars moving cached prey items from human structures to locations farther away from human habitation.

While cougars are normally most active at dawn, dusk, and nighttime, we have found that they adjust their activity patterns within urban areas to be more active at night, after human activity declines. Of the times we recorded a cougar located within city limits, 76 percent occurred between 11 p.m. and 5 a.m. We observed that cougars generally entered the city at night, traveled longer than normal distances to reach daybeds, and returned to urban prey caches the following night significantly later than they would return to a cache in a more remote setting.

Credit: Ian Morris

Photographed from a home in the foothills outside Boulder, a female cougar drags a freshly killed deer across a driveway before caching it in a nearby tree. As human populations expand into the wildlands of the American West, even cougars behaving normally–stalking, eating, and caching prey–may wind up in developed areas.

None of the 62 collared cougars have shown any signs of habituation to or selection for domestic animals, suggesting that depredation on domestic animals by cougars is primarily opportunistic. After investigating more than 1,100 potential predation sites and more than 400 confirmed feeding events from our data, cougars have killed or scavenged just 23 domestic animals, including an alpaca, a domestic bird, five dogs, and 16 domestic cats. Cougars have also attacked dogs when the pets investigated a prey cache or roamed into undeveloped areas in cougar habitat.

In addition to our Boulder-area study, we've been tracking cougar population dynamics for the past six years in a slightly more wild setting, on the Uncom-

pahgre Plateau in western Colorado. We've tracked 11 GPS-collared cougars venturing into Log Hill Mesa, an exurban development on the plateau that happens to be in high-quality cougar habitat. Fortunately, our findings there give little cause for concern: None of the collared cougars have been reported killing livestock or pets, nor have they required any management actions by CDOW related to human interaction.

The Future of Exurban Cougars

Most people in places like Boulder or Log Hill Mesa are aware that they live in cougar habitat and generally acknowledge their responsibility for coexisting with cougars in these areas. Yet when a pet is killed or hikers have an inopportune sighting, the tendency of most is to blame the cougar, assuming it had become habituated to people, was young and inexperienced, was sick or unhealthy, or otherwise was doing something that a cougar should not do. The truth is that sometimes humans encounter a cougar simply doing what cougars do—hunting in the place where they live.

As humans continue to move into the urban-wildland interface, it is virtually assured that human-cougar interactions will also continue, or even become more common. But there are steps we can take to reduce or improve these interactions. If residents allow deer to roam in yards and neighborhoods, pets to run free, and livestock to graze unprotected, negative interactions will increase. Conversely, if communities alter local habitats to make them less desirable to both deer and cougars, practice proper animal husbandry, and educate themselves and their children about how to live in cougar habitat, they will likely have fewer and more-positive interactions with cougars.

The road toward acceptance will not always be smooth, as human attitudes toward cougars are very polarized. Managers will be forced to make hard decisions about the level of tolerance of cougars in developed areas, balancing cougar conservation, human safety, and opposing viewpoints. With our research and that of other groups indicating that many cougars are using urban areas opportunistically on a limited basis, it may mean that maintaining those individuals on the landscape could help achieve a more-peaceful coexistence. Additional research on cougars in exurban environments will provide the tools necessary to minimize conflict while maintaining healthy cougar populations. ■