

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

Draft prepared for public review 9/9/2011

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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 excellent habitat for a number of native wildlife species including the 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 bases.

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 sighting 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.

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 and mountain lion attractants in the urban area;
- Increase public awareness of how to minimize conflicts with black bear and mountain lion; and
- Identify costs and prioritize actions for plan implementation.

The City of Boulder and the Colorado Division of Parks and Wildlife (CPW) are important community 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 in understanding the tools the city has available to use in minimizing potential conflict between residents and black bears or mountain lions in the city. The CPW is responsible for developing direct handling protocols and procedures, and the management of bear and mountain 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 black bear and mountain lion management practices and policies 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, trash management).

Black Bear

The City of Boulder has a history of black bear 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 attractant 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 throughout the western edge of town where bears are entering the city and more active. Since most Boulder residents have three containers for trash, compostables and recyclables, there are three residential waste containers serving as potential attractants.

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 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 monitoring information. (3rd year)

This approach to addressing the accessibility of trash to black bears recognizes that a new regulation requiring bear resistant containers may not be 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 the community members the opportunity to take voluntary action that could lessen or eliminate the 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 most recent reported human attack in Boulder County 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. As a result, residents are concerned about their safety, and the safety of their children.

Mountain lions spend most of their time in natural areas, however lions are also opportunistic predators that prey on urban wildlife (i.e. deer, raccoons, fox, coyote) and domestic animals such as pets, goats, sheep llamas and chicken. In addition to prey, the city provides other necessary resources for lion 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:**

- 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 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 surrounded by thousands of acres of natural areas, 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. The specific **action items** include:

- Develop a website to provide public access to data on reported activity and information on local black bear and mountain lion behavior.
- 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 policy change by soliciting 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

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 of Boulder is surrounded by natural lands including 45,000 acres of Open Space and Mountain Parks lands, nearby United States Forest Service, State and National Park and various private lands in undeveloped portions of the county. All of these areas provide excellent habitat for a number of native wildlife species including the 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 many native wildlife species, including bear, lion, coyote and deer to wander into the city in search of food, water or cover.

Black bear and mountain lion 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 bear in the urban service area foraging on trash, fruit trees, bird feeders, and other food attractants. Similarly, mountain lions, though generally secretive animals with much of their presence and activity in the city likely going unnoticed, have long utilized the urban service area in their search for resources.

The first and only documented mountain lion attack on a human on City of Boulder owned property was in 2006 on Flagstaff Mountain, over 3 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 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 or a threat to public safety, the animal is destroyed.

In Boulder over the past several years, CPW destroyed an average of one black bear or mountain lion annually and relocated or negatively conditioned several others because of nuisance behavior or a potential threat to public safety. However, it is neither practical nor feasible to completely eliminate these animals in the urban area. Like many 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 bear and lion in the urban area. By improving community awareness on how to co-exist in bear and mountain lion habitat, we hope residents will take action to reduce attractants on their property, and hence minimize the presence of black bear and mountain lion 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 our 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 and mountain lion attractants in the urban area.
- Increase public awareness of how to minimize conflicts with black bear and mountain lion.
- 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 unsecured trash, recycling or composting containers 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 children's school.

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 the following:

- Inconsistent communication with the public and the CPW
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.
- Lack of on-going public education
The city does not provide enough public education about bear and lion behavior, human and pet safety issues, and individual actions to reduce attractants and minimize potential human/wildlife conflicts.
- Insufficient management of trash and other attractants
Many aspects of the urban environment are inviting to bear including trash, fruit trees, bird feeders, pet food and apiaries. The city, however, has not fully developed strategies to reduce bear attractants, particularly trash, compostables and recyclables.
- Feeding Wildlife
Food put out to feed birds, fox, deer or other wildlife can attract bear, or attract prey for mountain lion 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 invite human/wildlife conflicts.

Relationship to other City Plans

The Urban Wildlife Management Plan

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 wildlife in the city. 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 the black-tailed prairie dog within the city. The bear and mountain lion management plan is the second species-specific component to the UWMP.

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 the responsibility to reduce potential conflicts lies with the collaboration efforts stated within 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, the Zero Waste Master Plan, will identify recommended facilities, programs, services and regulatory changes that will 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 can be [and 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 bear and mountain lion in the urban service area. From this meeting and input from 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 the options in spring of 2011 (see **Appendix A** for planning process diagram).

Agency Roles

The City of Boulder and the State of Colorado Division of Parks and Wildlife (CPW) are important community 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 assessing the tools the city has available to use in minimizing potential conflict between residents and black bears or mountain lions in the city.

The CPW is responsible for the direct handling and management of bear and mountain lion 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 (i.e. shooting a bear in a dumpster with a bean bag) however, the city’s role in developing black bear and mountain lion management practices and policies 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, 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 a city Open Space and Mountain Parks (OSMP) 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 U.S. They historically occupied nearly all of the forested regions of North America, but in the U.S. they are now restricted to the forested areas less densely occupied by humans.

The American 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 of Boulder.

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 train 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 bear 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 bear 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 and be aggressive to humans.

Efforts to reduce potential 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. Bears that consume trash ingest unhealthy materials such as foils and plastic that present a health threat to bears. Failure to secure trash, leaving piles of trash until trash pickup day or overfilled trash receptacles are very luring to bear that are in search of food. Bears that access trash drag and spread household waste on streets, lawns and alleys. Basic neighborhood sanitation is compromised when trash is scattered by bears. Reducing attractants in the city can help minimize the number of bears that must be destroyed as a result of nuisance activity and the potential for harm to the health of bears and humans.

Bear activity monitoring

In spring 2009, city staff began consistent monitoring of bear activity within the city limits of Boulder. By collaborating with the 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. The majority of reports (60% or 124 reports) did not identify associated attractants. However, for the majority of reports that do have an associated attractant, the attractant was trash (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 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 6-3-9 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 defense that a person is feeding only wild squirrels or 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 the OSMP have education and outreach programs that 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 bear have shown a pattern of spending time in residential areas.

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 container¹. Since that time, a total of 45 containers have been ordered in Boulder County (not all in the city).

Trash Storage in Parks and Open Space Trailheads

The city has installed and maintains bear resistant trash containers in the western city owned parks and trailheads. These areas were easily accessed by bears and securing them has decrease 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 below), recognizes 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 lessen its lure to a bear by the type of container used and how they are stored. Boulder would

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.

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 has often been 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 the 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 bear are present in the area and may get into trash. 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 and Canada 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 where bears are more active. 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 adapt 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.

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, 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 wildlife including deer, raccoons, etc. 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 that presents a health threat to bears. In addition to trash representing the most significant attractant and threat to bears, modifications to trash disposal can be made without conflicting with other city priorities such as local food production.

All of the above mentioned attractants presents 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/compost attractants with more significant efforts focused on trash and compost and about 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 and lack of awareness of the problem or community agreement 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 members the opportunity to take voluntary action toward reducing attractants.

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, reducing attractants, living with bear in the city, and the number of bears destroyed as a result of conflicts 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 bear 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 trash incidents) to supplement resident reports and to try to identify the specific container 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 in light of 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 monitoring information. (Third year)

- If need is evident and community support for bear resistant containers is expressed, revisit options (3rd year).
- 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, proposed recommendations

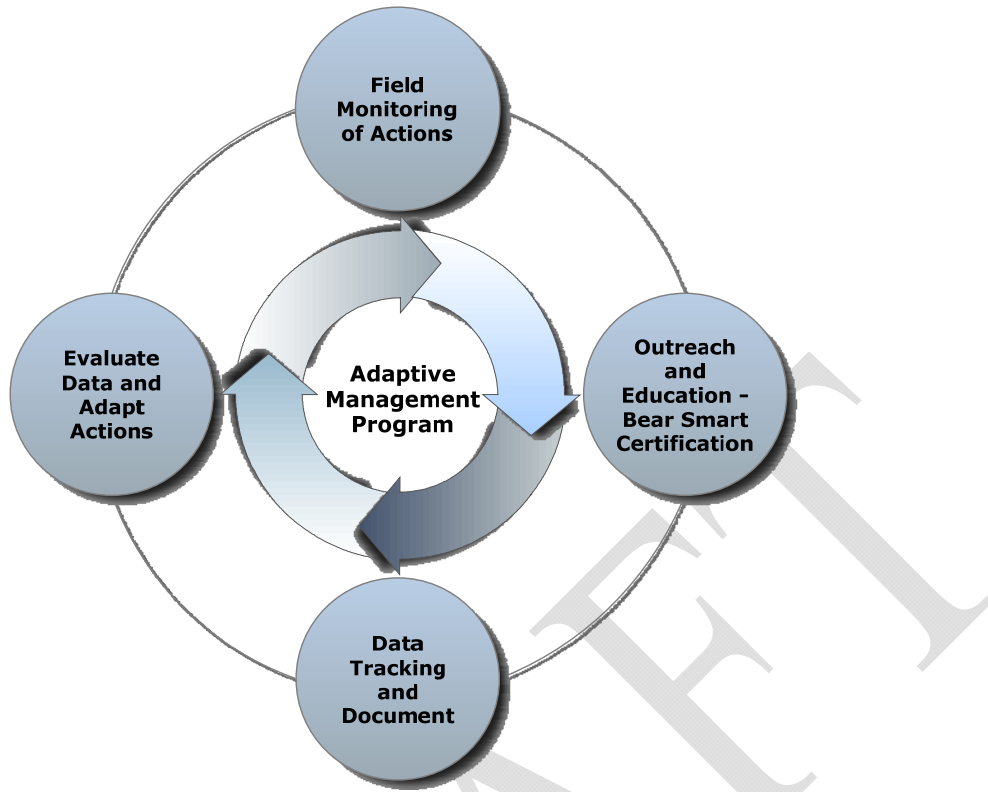
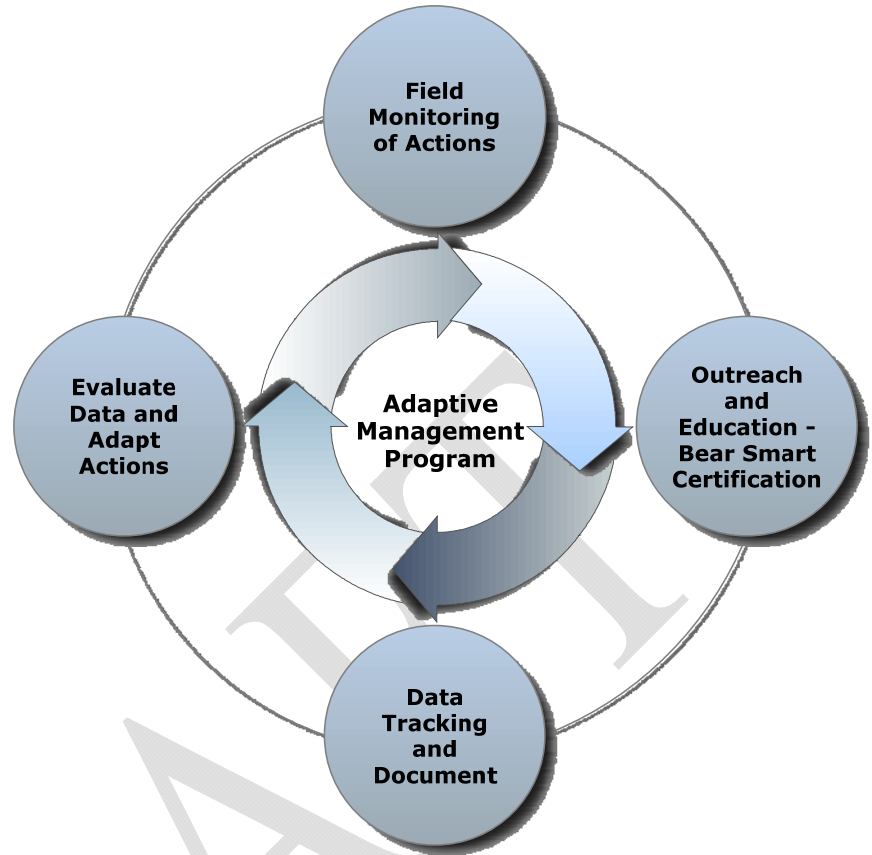


Figure 1. Adaptive Management Diagram



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Chapter 3: Mountain Lion

Behavior, Biology and Importance

Mountain lions have the largest geographic range of any American native mammal (other than humans) 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 the 1970s the mountain lion was declared a game species, providing the first form of protection the species had seen. 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. The growing population and land development has increasingly limited the amount of suitable habitat space available for lions to use. In the United States today eastern populations are extinct or endangered, and 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 rabbits, squirrels, porcupines, raccoons, skunks and other small mammals. Domestic livestock such as cattle, horses, sheep and llamas as well as pets including 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 can live on lands adjacent to cities as long as they have ample prey and cover for resting and hunting. The primary causes of lion mortality are

human-caused (vehicle collision, depredation removal, and habitat loss) followed by disease, competition with other mountain lions, and accidents such as injuries inflicted by prey.

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 such as open space areas 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 lion including water and shelter.

Mountain lions have long been spotted within and around Boulder. The most recent reported human attack in Boulder County 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.

Lion activity monitoring

In spring 2009, city staff began consistent monitoring of mountain lion activity 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).

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 lions as well as removing lion caches, and is 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 reducing attractants and using deterrent methods to reporting parties of 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.

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 focusing efforts on education and increasing public awareness through a Mountain Lion Awareness Plan. Information regarding the risk of mountain lion interactions, how to avoid attracting them to the urban area and how to behave in the instance of an interaction is critical to addressing the concerns of Boulder citizens for their safety. The plan objective is to improve interagency communication and increase public awareness, understanding and acceptance of personal responsibility:

- 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 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.

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 both at home and while enjoying use of city lands. We look at this project not as a “warning,” but rather a learning opportunity through which everyone can feel more secure.

Ultimately, we want the public to enjoy the outdoors as much as possible. Stressing awareness and personal responsibility is critical. A successful campaign would include reaching the target audience, informing them how mountain lion awareness fits into their own lives and communicating to them the city’s involvement in wildlife safety and information. If desired, responses can be measured through questionnaires, surveys and open house meetings to assess our plan’s effectiveness.

Key messages

Boulder is in mountain lion habitat and therefore, we must practice behaviors that encourage co-existence.

1. Individuals must exercise personal responsibility by learning about mountain lion behavior, safety precautions and emergency contact information for the 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, and keeping your house non-penetrable to large animals.

3. For citizens interested in reducing the chance that they could encounter a lion on their property, changing landscaping to remove attractive resting and hunting areas, removing any attractants that may be drawing potential lion prey (deer) to their property and removing water features are strategies that may reduce the chance of a lion using their property.
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.

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:

- Providing 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 2340 children annually
 - Adult programs: 6 annually reaching 296 people annually
- Media story placements include information on how to live with bear and lion and reduce potential conflicts (UWC):
 - 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 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 lion 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 UWMP are to promote the protection of our local wildlife, and increase the safety of residents and their pets through improved community awareness and reducing attractants where it is 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 Procedure or Regulation Development.

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 educate and 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: Continue education and outreach efforts including 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 Procedure, Policy or 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 received from the community.

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” to trash, compost and/or recycling collection containers. This additional information will help inform management plan updates. The upcoming

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

In addition to allowing staff to continue to take a collaborative approach to master plan updates, this additional monitoring information will help residents understand urban bear behavior, evaluate the magnitude of urban bear conflicts, and be overall better informed to provide ideas and feedback on potential city policy and code changes.

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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Enhance outreach and Marketing with educational materials (\$5,000 CP&S). 	<ul style="list-style-type: none"> • Develop interactive web tools that represent 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

	<p>bear and the availability of bear resistant trash containers (OSMP; CP&S).</p> <ul style="list-style-type: none"> Continue to target education and outreach with use of ‘Bear Aware’ volunteers, based on bear activity (OSMP). 		<p>program (\$20,000 and additional staff resources).</p> <ul style="list-style-type: none"> Enhance use of “Bear Care” volunteers, by hiring staff to build a stronger volunteer program with increased training, responsibility and incentives for volunteers.
<p>INTERDEPARTMENTAL AND INTERGOVERNMENTAL COORDINATION</p>	<ul style="list-style-type: none"> 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). 		
<p>CITY PROCEDURE or REGULATION DEVELOPMENT</p>	<ul style="list-style-type: none"> Develop and implement a two year monitoring program of black bear activity and attractants in high activity areas to supplement resident reports (CP&S). 	<ul style="list-style-type: none"> Increase frequency and area of data collection over the next two years (additional staff resources). 	<ul style="list-style-type: none"> Design and implement an on-going systematic monitoring program for bear activity in the western urban interface (\$20,000).

	<ul style="list-style-type: none">• 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).	<ul style="list-style-type: none">• Develop on-line survey (\$5,000 CP&S).	<ul style="list-style-type: none">• Design and conduct full representative community survey (\$20,000).
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