

**OF BEARS AND PEOPLE: A VISUAL CASE STORY OF BOULDER, COLORADO'S
EFFORTS TO COEXIST WITH LOCAL BRUIN**

by

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ABSTRACT

Each year in Boulder, Colorado, human communities frequently experience a variety of negative interactions with black bears. Unsecured trash, unharvested fruit, bird feeders, and other attractants are the common culprits that lure bears into urban areas. As a consequence, bears may become habituated to urban life and require physical management action to be taken, such as relocation or euthanasia. The presence of city-dwelling black bears also poses a threat to human safety as well as other matters relating to property damage. In response to these concerns, this Master's thesis explores how community engagement efforts and visual storytelling materials may help reduce human-black bear conflicts in Boulder, while also serving as a guide to coexistence for other communities living with these omnivores. In this visual storytelling project, my goals were threefold: to identify local stakeholders and understand past, present, and current efforts taken to reduce human-bear conflicts; to understand community values of and experiences living with local black bears; and to display my findings in a visually engaging way that could encourage Boulder residents to adopt proactive measures which may reduce negative conflicts with urban black bears. I employed a variety of methods to accomplish these goals, ranging from formal and informal interviews, an online community survey, photography, videography, and research taking place through online and print materials as well as through stakeholder conversations. I identified local stakeholder groups to be Colorado Parks & Wildlife, the City of Boulder, and Boulder Bear Coalition, and worked with each group on a voluntary basis to better understand community engagement efforts in the area. The Bears & People case story is available online at www.bearsandpeople.com.

INTRODUCTION

It was about 7:00 pm when I arrived to downtown Boulder in late June of 2017. I noticed a crowd of people standing around an area where police tape had cordoned off the majority of 16th Street between Pearl and Spruce. I stopped for a moment to digest the scene, and quickly dipped under the tape after determining where I needed to go. As I greeted the wildlife officers and volunteers, I looked up into a tree and found what I was looking for: a two year-old black bear nervously pacing around. This bear was having a very bad day; he was going on his fourteenth hour stuck in a tree, surrounded by humans. Between this tree being just one block north of the bustling Pearl Street Mall and an article posted by the Daily Camera which shared the bear's location, hundreds of bystanders had made their way over to the area throughout the day to catch a glimpse of the bear.

I was there as a Colorado Parks and Wildlife volunteer bearsitter. My job was to keep the bear in the tree until the sun went down, and to assist with crowd control. I had bearsat numerous times before, but this was by far the most challenging due to the large crowd of people forming that didn't quite understand what we were doing. People yelled things like, "leave the bear alone!," "just let the bear come down!," and "don't kill the bear!" Meanwhile, this poor animal was stuck in a tree without any food or water, surrounded by humans, loud noises, and tempting aromas from downtown Boulder restaurants. The frustrated bear began moaning loudly, over and over, which in turn made me want to cry. We wanted to let the bear come down, but how could we do that with all these people gathered around? Didn't they realize that if they simply left, we could let the bear go? There were numerous concerns to consider: with all the bystanders, he might run into someone and act aggressively, which could require the authorities to take lethal action. Or maybe he would get hit by a car as he tried to cross several

busy intersections on his way back to the mountains. We were simply trying to prevent any of these negative scenarios from taking place.

By the end of the day, we had six bearsitters, four wildlife officers, and two police officers on the scene. The bear was getting restless, and despite all our efforts to keep him safely in the tree, we knew he was about to come down. The police officers began rerouting traffic so we could encourage the bear to go north on 16th street, and ideally back west to the mountains. Most people were very kind and respectful, but as the bear was preparing to come down, a few individuals refused to listen as we tried to clear the area. Despite our requests, two groups of people standing in the bear's escape route refused to leave. Sure enough, the bear came down at 8:30pm, and as we hazed him towards Spruce Street with loud sounds and waving arms, he nearly ran directly into the group of people ignoring our requests, and was almost hit by an oncoming car. It was a foot race after that, and though he did go north like we wanted, he instead chose to run further east into Boulder, through an area that had unsecured trash cans and other tempting attractants. We found him a few blocks away, back up a tree in a person's backyard. The bear was clearly stressed and began groaning and hissing at us as we approached the tree. It was getting dark, and the wildlife officers decided we just needed to leave the area so the bear could come down on his own. The hope was that this horrible day would leave quite an impression on this bear, which would encourage him to steer clear of Boulder's urban areas in the future. It wasn't the bear's fault; he was just following his instincts and trying to survive. This incident left no doubt in my mind: we needed to find a way to increase local knowledge of urban wildlife and empower residents to adopt proactive efforts that would prevent episodes like this from happening in the future.

In a time of information overload and lost connections to nature, it's a challenge to get people to take interest in matters such as wildlife and land conservation. However, as human

populations increase, our landscapes change too, with wild spaces becoming less abundant. As a result, conflicts with wildlife will grow as human communities continue to move further into wild habitats. Our urbanizing society has forgotten that we humans are a part of nature, and not separate from it. This disconnect between humans and nature, or nature deficit disorder (Briggs), is leading us into a time where the world's wildlife species are going extinct at a significantly faster rate than for millions of years before (Carrington). At an initial glance, this sixth mass extinction may not seem to have any effect on human populations, but in reality, this requires our utmost attention as each and every one of us relies on the life-supporting systems that nature provides us, like clean air, fresh water, and nutrient-rich soils and pollinating species that produce sustainable foods and resources. As a way to cut through the noise and encourage people to pay attention to and take action on behalf of wild nature, I focus on Boulder's efforts to coexist with local black bears (*Ursus americanus*). By focusing on one identifiable species and region, my Bears and People Project will demonstrate how the use of proactive community efforts and visual communication may produce greater willingness among residents to prevent negative interactions with wildlife, which may result in heightened wildlife protection and community safety.

PROJECT OVERVIEW

When I moved to Boulder, Colorado, in 2011, I wasn't the most familiar with the wildlife in the area. Like many, I moved to Boulder to be surrounded by its abundant open spaces and mountain backdrop, and to enjoy the healthy outdoor lifestyle. I had never known much about, or even seen, a black bear until just a few years ago. It wasn't until I met a woman named Brenda Lee in 2015 at an unrelated meeting through my job at the WILD Foundation that I had begun to give these animals much thought. Right around the time I moved to Boulder, Brenda had started a nonprofit organization called Boulder Bear Coalition. She and I spent a great

deal of time talking informally about the work Boulder Bear Coalition does, as well as the challenges of living with large carnivores like black bears.

Year after year, black bears would wander into town, raiding unsecured trash cans, bird feeders, unharvested fruit, and more. In some areas, alleyways were littered with trash, infested by rats, and posed a number of health and sanitation concerns. Public safety was a major concern, as black bears are indeed powerful, carnivorous animals that can range anywhere from 100-600 lbs (Masterson 38). On the other end of the spectrum, “nuisance” bears that become habituated to urban life and no longer fear human presence sometimes require euthanasia. Regardless of these concerns, it seemed challenging to get the community and city council to take action. In 2011, city staff originally tried to pass an ordinance that required residents to secure their trash from bears. After multiple community meetings, the city found that although residents seemed to be aware that bears were present in urban areas, there unfortunately was no appetite for passing any type of trash ordinance. In hindsight, the city’s Urban Wildlife Conservation Coordinator told me in an interview that she felt they could have done a better job with linking bear deaths to unsecured trash.

That seemed to do the trick, when in 2014 Boulder implemented a Bear Protection Ordinance, which required city residents west of Broadway and south of Sumac Avenue to secure their trash and compost in bear-resistant containers. The ordinance, though already involved in conversation, was passed unanimously after four highly habituated black bears were killed in 2013 upon getting into unsecured trash. The death of those four bears was a major upset for the Boulder community, and became a turning point for the city’s coexistence efforts. Brenda Lee founded the Boulder Bear Coalition the year before and helped strengthen the community voice in support of local black bear protections.

Upon learning of all these efforts taking place on a community and municipal level, I took any opportunity I had to expand my knowledge of this adaptable animal and to get involved on a personal level. I began volunteering as a bearsitter, provided communication and outreach support to Boulder Bear Coalition, offered suggestions to concerned residents through digital media platforms like Facebook and NextDoor, and talked to as many people as I could who were involved with bear management in the area. In late 2017 I began facilitating monthly meetings as an independent graduate student between the City of Boulder, Boulder Bear Coalition, and Colorado Parks and Wildlife, so each of these groups was able to have more face time with one another, which in turn helped with coordination on bear-related issues. Through these combined efforts that helped me formulate my thesis, I learned just how much the Boulder community cares about its open space and wildlife. Because residents place such high value on Boulder's wild spaces, it also requires local governing bodies to follow suit.

If it weren't for the community and dedicated city council members, Boulder may not have a fulltime Urban Wildlife Conservation Coordinator who could help research and implement policies like the Bear Protection Ordinance. How black bears are managed could be different, too. Colorado Parks & Wildlife (CPW) is responsible for managing all wildlife populations in the state of Colorado and keeping human communities safe. Because many residents here yearn to safeguard local wildlife, CPW aligns its management practices with the community's desires and tolerance levels. CPW District Wildlife Manager Kristin Cannon said to me in an interview that when CPW manages wildlife, they are managing for populations and not individual animals. They try to manage not only with the carrying capacity of the natural environment in mind, but the social carrying capacity as well. Social carrying capacity refers to the community's tolerance of wildlife in the area. That's not to say animals such as black bears are free to do as they please, but that CPW officers are taking Boulder's tolerance of wildlife

into deep consideration before making any decisions. It must also be mentioned that “coexistence” does not mean that residents are going about their days with black bears just hanging out in their yards; coexistence means developing ways in which living together works as well as it can. Boulder’s Urban Wildlife Conservation Coordinator, Valerie Matheson explained to me that the bears aren’t going anywhere, and neither are the people. Coexistence in this sense refers to humans making it less inviting for bears in urban areas, so the bears can remain healthy and wild in their natural habitat.

Without government agencies like Colorado Parks & Wildlife and the City of Boulder, or nonprofits like Boulder Bear Coalition, residents may lack the knowledge and actions that will allow them to peacefully coexist with animals such as black bears. In my work, not only have I learned how necessary community support is, but I also discovered that implementation, enforcement, and compliance are key pieces to making coexistence possible. Having policies such as the Bear Protection Ordinance is a big deal, but if it can’t be enforced to ensure that residents will comply with the policies, it unfortunately won’t go very far.

Compared to many other cities living with black bears here in Colorado and throughout the country, Boulder is seeing high success rates in terms of reducing human-black bear conflicts. Having the community support and dedicated enforcement is what makes Boulder stand out, as I’ve discovered from talking to numerous individuals both locally and in other Colorado cities. In Durango, for example, a nonprofit organization called Bear Smart Durango works daily to educate residents and support city and county-wide coexistence efforts. Durango has a similar trash ordinance as Boulder, but according to Bryan Peterson, who heads up Bear Smart Durango, the community support and enforcement just aren’t where they should be yet. Of the 689 total reports that the City of Durango’s code enforcement department received in 2017, just 43 of those resulted in actual fines (Peterson, Bryan. Email

Communication. 19 Feb. 2018). Additionally, 2017 was an extremely lethal year for bears within Durango's city limits. Despite Bear Smart Durango's continuous outreach and education efforts, 25 bears were killed upon becoming nuisances. In comparison to Boulder, Code Enforcement officers here shelled out 1,376 citations (Riley, Jennifer. Personal Communication. 19 Feb. 2018) within the Bear Protection Ordinance zone in 2017, and only one bear required lethal action within Boulder's city limits.

As I continued to delve into Boulder's history with bears, I also began to see the opportunities we as a community have to improve our relationships with our wild neighbors. I had a general sense that the community was indeed supportive of protecting wildlife and showed high value in animals like black bears. This seemed obvious from my regular encounters with residents while out bearsitting, or from online conversations with individuals via Facebook or NextDoor, but I wanted to know for sure. To avoid making any assumptions, my next step was to solicit feedback from the community. For three weeks I welcomed comments from Boulder County residents by ways of an online survey. Survey results are explained in greater depth throughout this paper, but from the 368 responses I received, I learned that residents were generally quite tolerant of and placed high value in Boulder's black bears. The fact that I obtained over 360 responses without any paid promotions and was able to get an online and print article featured in the Daily Camera (Bear), is telling in itself; people do indeed have something to say about bears. Although I did not include a final comment box at the end of the survey, numerous individuals contacted me on their own accord through email or other online platforms to share their thoughts and concerns.

Between my survey data, volunteer efforts, and numerous conversations with Boulder residents and individuals involved with bear management, I've learned that we must do more as a community to prevent further conflicts with wildlife. In this time of information overload and

lost connections to nature, the black bear presents an opportunity to reconnect individuals with their wild roots and encourage them to take action on behalf of wild nature. I've discovered through my community endeavors throughout the past three years that many individuals in Boulder feel quite strongly about black bears and tend to anthropomorphize the individuals or families that make regular visits into town. One specific example comes to mind, when in 2016 there was a sow and two cubs that took up residence in one man's backyard cottonwood tree. Steve and his young daughters marveled at the continuous presence of these bruins, and fondly named the mother Marge, and the two cubs Maggie and Lisa, after the popular TV show, *The Simpsons*. It was as though these bears became part of their own human family.

Although biologists and wildlife managers may not jump at the opportunity to ascribe human qualities to a wild animal, scenarios like Steve's speak volumes in regard to how exactly we can communicate with our fellow community members; speaking about *the* identifiable animal vs. *an* animal can prove to be powerful (Small and Lowenstein 7). Steve felt he was protecting the bears by not telling wildlife authorities when they would come by his home. The bear trio would generally climb up into the tree and sleep all day, not bothering anyone. Unfortunately, on their way over to his property, the sow and cubs were frequenting other residents' trash bins, fruit trees, and defecating all over the place. On another day, the bears chose a big tree across the street from his house to rest in. That might seem harmless, except for the fact that this tree was right next to an elementary school. The school went on lockdown for the day and closed off the back area while bearsitters and wildlife officers monitored the situation. Some of Steve's neighbors were not thrilled about the presence of these three bears and wanted them gone. Normally there were no attractants for the bears to get into on Steve's property, but one day he noticed they were beginning to get into the pear trees in his yard. After continued communication with Steve, he realized it was time for Marge,

Maggie, and Lisa to go. Through the Community Fruit Rescue and Boulder Bear Coalition, we harvested the remaining pears from his property. It was a bittersweet moment; he and his daughters were sad that the bear family may not return, but they understood they were helping to protect the bears and keep them wild.

That is the goal of my Bears & People Project, to educate residents and encourage them to connect the dots so they may take an active role in reducing human-black bear conflicts here in Boulder. The aim is to provide information to people who may not have a deep understanding of black bears as a species, who haven't had much experience living with urban wildlife, or those who tend to be rather apathetic about Boulder's coexistence efforts. By presenting the black bear as an identifiable character, as opposed to a larger group or statistic, readers will have the ability to more easily connect to an issue such as wildlife coexistence (Perrault et al. 295).

METHODS

In this visual storytelling project, my goals were threefold: to identify local stakeholders and understand past, present, and current efforts taken to reduce human-bear conflicts; to understand community values of and experiences living with local black bears; and to display my findings in a visually engaging way that could encourage Boulder residents to adopt proactive measures which may reduce negative conflicts with urban black bears. I employed a variety of methods to accomplish these goals, ranging from formal and informal interviews, an online survey, photography and videography, and research taking place through online and print materials as well as through stakeholder conversations.

To achieve my first goal of understanding past, present, and current efforts taken by local stakeholders to reduce conflicts with black bears, I began my work with a number of

informal conversations, beginning with Brenda Lee of the Boulder Bear Coalition. Through Brenda, I learned of the Boulder community's concern for the wellbeing of urban black bears, and through our conversations and further research, I determined the main stakeholders were Boulder Bear Coalition, the City of Boulder, and Colorado Parks and Wildlife. With each of these groups, I initiated my research with informal conversations over email and through in-person meetings. To understand the full scope, I also met with individuals from each of these three groups (Brenda Lee of Boulder Bear Coalition, Valerie Matheson of the City of Boulder, and Kristin Cannon of Colorado Parks and Wildlife) to record formal audio interviews. I also enrolled as an active volunteer for each of these groups. With Boulder Bear Coalition, I assisted the nonprofit organization with program development, communications and outreach initiatives, and volunteer management. By joining the volunteer bearsitter program, which is co-managed by the City of Boulder Open Space and Mountain Parks (OSMP) department and Colorado Parks and Wildlife, I recognized how these governing bodies responded to urban bear sightings. Additionally, my active role with the bearsitter program led to me being asked by OSMP to step up as a bearsitter coordinator (still on a voluntary basis) to further assist with communications and planning between wildlife officers and bearsitter volunteers. Much of my independent research involved online documentation made available by the City of Boulder and Colorado Parks and Wildlife, as well as in-person investigation of both agencies' human-bear conflict data archives.

My efforts to understand the Boulder community's values of and experiences living with local black bears also began through informal conversations and interviews. It commenced with general discussions with bearsitter volunteers and the general public while I was on the ground bearsitting. Here I learned that the individuals I did talk to generally felt quite passionately about protecting black bears, but were also frustrated when negative interactions

took place. I also learned that many residents did not understand how to prevent conflicts such as bears getting into their trash or appearing on their property. These mindsets seemed to be quite common, but I did not know for certain. To assimilate the broader Boulder community's values and experiences, I designed an online survey that was disseminated to residents living throughout Boulder County. Survey methods were compliant with the University of Colorado Boulder's Institutional Review Board (IRB) and received the proper approval before I initiated any human subjects research. In addition to the survey, I developed an active presence on social platforms such as Facebook and NextDoor in order to observe and engage in residential conversations about local wildlife.

Concurrent with the methods listed above, I also documented these on-the-ground efforts through photography and videography. Because I held an active volunteer role with these programs, my priority was first and foremost to carry out my assigned tasks. When multiple volunteers were present and the scene was under control, I captured photos and videos of urban black bears during bearsitting events. I also followed up with individual volunteers and received their permission to film interviews of them discussing their experiences with bearsitting. I also documented additional programs and events related to human-bear interactions, such as volunteer projects led by Boulder Bear Coalition. Camera traps were set up to capture bear activity in urban areas as well as in Boulder open space. After seeing videos of urban black bear activity on YouTube, I contacted two Boulder residents to request permission to display their videos in my project, with their credits. I developed good relationships with these individuals, and one continues to send me security camera footage of black bears attempting to get into his alleyway trash and compost bins. While the photo and video documentation can help readers to visually connect to the real-life activities, I also partnered with two artists to further demonstrate Boulder's coexistence efforts. Erin Hauer, an

environmental design graduate of the University of Colorado Boulder, created custom watercolor paintings and photographic montages to illustrate the natural history of black bears. Carly Hill, a content creator and graphic artist, worked with me to create comic strip materials to teach residents the right and wrong ways to live alongside urban black bears. While I directed the vision of these projects, these two creatives took it upon themselves to personalize the illustrations and design them in a way that would be the most appealing for viewers of my Bears & People Project.

VISUAL CASE STORY

In addition to my project's call for community participation as a way to obtain peaceful human-wildlife coexistence, I explore how the power of visual rhetoric and use of the black bear as an identifiable victim, or character, can aid in engaging and empowering residents to take an active role in protecting wildlife and promoting community safety. This is relevant as we live in a world of information overload, where attention spans are becoming shorter, and the amount of cognitive clutter proceeds to grow. Every piece of information a person takes in is competing for resources in their brain, whether it be something important like studying for an exam or preparing a report, or a mundane task such as browsing through your Facebook news feed (Levitin 7). In a time such as this, communicating issues related to environmental and wildlife protection is no easy task. Cognitive linguist George Lakoff attributes this to "environmental hypocognition," or the lack of ideas we need in the case of solving environmental issues. Lakoff suggests that what is needed is a frame that captures the reality of the situation (Lakoff 76). In the case of Boulder's black bears, I explore how the frames of community empowerment and visual storytelling may help reduce the amount of negative interactions humans have with bears.

This is relevant considering human attention spans are dwindling. According to a study led by Microsoft, the average human attention span has fallen from 12 seconds in 2000, down to 8 seconds in 2013. The study found that humans now have shorter attention spans than goldfish (Microsoft Canada 6). Chief Executive Officer of Microsoft, Satya Nadella states, “We are moving from a world where computing power was scarce to a place where it now is almost limitless, and where the true scarce commodity is increasingly human attention” (Microsoft Canada 4). The Microsoft study finds the top factors impacting attention to be: media consumption, social media usage, technology adoption rage, and multi-screening behavior (Microsoft Canada 14). Overall, digital lifestyles have a negative impact on prolonged focus. Online users tend to jump from subject to subject or screen to screen looking to continually engage with new and exciting pieces of information.

In the 54-page report, Microsoft researched Canadians’ waning attention spans and found that although digital lifestyles are indeed changing our brains and reducing attention spans, digital connectedness also trains us to seek out more information. This means marketers and communicators need to find exciting and innovative ways to captivate viewers. For instance, Microsoft provides a few suggestions, such as excluding any unnecessary information from materials, creating personal messaging that communicates clear consumer value, and providing ‘calls to action’ that link to additional content. It’s clear that our environment is rapidly changing, leaving communicators with no option but to adapt.

MacInnis and Price state that the use of imagery in marketing context is shown to affect a “multitude of cognitive, physiological, and behavioral phenomena.” Furthermore, it is “likely to be important in understanding incidental learning, numerous facets of the choice process, the likelihood and timing of purchases, and the nature of many hedonic and symbolic consumption experiences and re-experiences” (MacInnis and Price 486). Their research shows that imagery

can offer a positive sensory and emotional experience and play an important role in remembered consumption and intention to repurchase. However, in order for images to be used as a form of rhetoric, the visuals must have certain characteristics. In her studies focusing on images and advertising, Linda Scott explains that “visual elements must be capable of representing concepts, abstractions, actions, metaphors, and modifiers, such that they can be used in the invention of a complex argument” (MacInnis and Price 253).

Whether it be through still or moving images, this style of visual communication continues to pick up speed. In his book *The Rise of the Image, the Fall of the Word*, Mitchell Stephens addresses the fact that people aren't quite reading as much as they used to. He attributes much of this to the advent of the moving image, the television in particular. As technology advanced and increased the amount of brain clutter, Stephens saw the use of the “new video” and “fast cutting” as aiding with content absorption. Fast cutting, a video editing technique which refers to several shots being shown consecutively for a brief period of time (usually no more than 3 seconds long), proved effective in simply relaying a large amount of information in a short amount of time. We see this in action through platforms such as BBC's NowThis 15-30 second newscasts, which aims to update viewers in a hurry on current events (Arlen 20). Social networking sites like Facebook, Twitter, Snapchat and Instagram also display these types of short-form videos and single images that viewers can quickly scroll through. Even more so, Facebook recently changed its algorithm to place higher value in visual media such as videos and photos (Angelidou-Smith).

One tactic that has been used in relation to visual rhetoric and wildlife conservation is the identifiable victim effect. “The identifiable victim effect is when people are more willing to help identified individuals, than those who are unidentified, or statistical, victims” (Perrault et al. 295). Identifiable victims tend to receive greater cognitive attention and deeper consideration

due to the fact that people are more mentally and emotionally engaged when processing information about specific individuals. Statistical victims, on the other hand, tend to be more abstract and less emotionally involving. Those are the characters who will become victims but have not yet been determined. “*The victim is more emotionally gripping than a victim regardless of the size of the reference group*” (Small & Loewenstein 6-7). Referencing a study led by Markowitz et al., Perrault et al. stated that messages portraying an identifiable animal victim were related to a greater likelihood to donate than the messages that cited larger populations of animal victims.

When one considers that animals are often victims with little to no ability to address or control many of the threats that exist for them, animals may prove to be very sympathetic victims in environmental risk messages due to their perceived and perhaps very real helplessness. (Perrault et al. 296)

The Markowitz et al. study demonstrated that “compassion shown towards animals in need of aid decreased as the number of victims increased, identifiability of the victims decreased and the proportion of animals helped shrank” (Markowitz et al. 403).

A well-designed website is perhaps one of the most powerful tools an organization or business possesses. It allows the owner to frame content to its unique audience in a way that its readers will understand and is also one of the first places a person will go in search of relevant information. My website, www.bearsandpeople.com, features a variety of visual aspects mixed in with easy to digest text narratives, such as short videos, photography, audio clips, infographics, artwork, and other graphical elements. Pages are displayed as long-form scrollers and are inspired by the NY Times’ long-form stories. These types of pages, when constructed in a visual manner, help to engage readers and keep them on a page for extended

periods of time. In fact, a 2016 study led by the Pew Research Center found specifically with mobile readers that

Despite the small screen space and multitasking often associated with cellphones, consumers do spend more time on average with long-form news articles than with short-form. Indeed, the total engaged time with articles 1,000 words or longer averages about twice that of the engaged time with short-form stories: 123 seconds compared with 57. (Mitchell et al.)

Long-form articles also provide options in terms of what elements readers prefer to peruse through. The majority of the documentary visuals were created by me and were captured through my in-person community engagement efforts. To increase community involvement and empowerment and utilize imagery that I personally was unable to witness or capture, additional content was sourced from participating residents. Moreover, I collaborated with two artists, Erin Hauer and Carly Hill, to produce custom illustrations for this project. In general, all web content demonstrates a strong attention to detail, design, and general branding. Accompanying text was also written in a fairly simple and succinct manner, as to not overwhelm or confuse the readers.

To build off this project's visual focus, the Bears and People Project is structured as a case story, which blends aspects of the case-study methods with storytelling (Ackerman and Maslin-Ostrowski 1). It is a case study in the sense that it tunes into Boulder's factual efforts to coexist with black bears. However, my hope is to trigger an emotional reaction from viewers so they may feel inspired and empowered to take action. For that reason, I am framing my project as a story that has real-life characters, a plot, conflicts, and resolutions. Each piece of the story is outlined as highly visual chaptered vignettes which will help to capture the attention of readers, a constant dilemma for communicators involved in practices of all scopes and

mediums. The chapters consist of: character background (the black bear species; stakeholders such as the City of Boulder, Colorado Parks & Wildlife, and Boulder Bear Coalition); a look at Boulder and its community; the problems and consequences surrounding urban black bears; solutions that are being implemented; and ways for community members to get involved.

HISTORY OF CONFLICTS: BOULDER & COLORADO

With human populations increasing and natural habitats shrinking, it's likely that human-bear conflicts will continue to rise in the coming years. The problem, which is explained in greater detail throughout this paper, stems from rapid human development and bears seeking out human-provided food such as garbage, fruit, pet food, livestock, and bird seed. Colorado Parks and Wildlife's 2015 *Human Bear Conflict Report* explains that human populations in Colorado are on track to exceed 7.1 million people by 2040, with much of that growth taking place in the Front Range, where a significant amount of the state's black bear habitat exists (6). Black bear populations, on the other hand, are extremely hard to estimate. Due to the high costs and challenges of tracking a solitary animal such as the black bear, "all inventory efforts in Colorado involve extrapolating information about known bear densities in small geographic areas and applying them to larger areas" (*Human Bear Conflict Report* 6). Considering this, the current, conservative black bear population estimate for the state of Colorado is somewhere between 17,000 to 20,000 individual bears. CPW requires a mandatory check for all types of human-caused bear mortality, which includes everything from hunting, to conflict-related incidents between landowners or wildlife authorities, to roadkill, and accidental deaths like drowning or electrocution. With this mortality information, wildlife managers have confirmed that the black bear population throughout the state has declined since 2011. In their 2015 report, CPW explains that "because of wide variations in natural forage conditions across Colorado and the influence such variation has on human-bear conflicts, there is no direct or

immediate relationship between changes in bear abundance and the amount of conflicts” (*Human Bear Conflict Report 6*).

Looking into further detail, the intensity of these negative interactions between humans and bears does vary from year to year, and from place to place throughout Colorado. However, data shows that overall conflicts are generally increasing. In this paper, data is separated out on the basis of four regions: Boulder city limits, Boulder County, the northeast region of Colorado, and the entire state of Colorado. Due to the variety of data collection efforts from each region, available statistics vary and are explained in greater detail below.

Beginning in Boulder city limits, data is available in Figure 1 from 2003-2017 and includes the number of individual bears killed by CPW due to conflict, hit by cars, and euthanized due to reasons other than conflict (injury, illness, etc.). These records are available thanks to the City of Boulder’s Urban Wildlife Conservation Coordinator, Valerie Matheson. Matheson tracks this information in an online database and does this in coordination with the local Colorado Parks and Wildlife officers. After talking with Matheson, I learned that Boulder’s data collection efforts are unique compared to other cities, which demonstrates the city’s dedication to understanding trends related to bear conflicts. Few other cities track wildlife conflict data like the City of Boulder does.

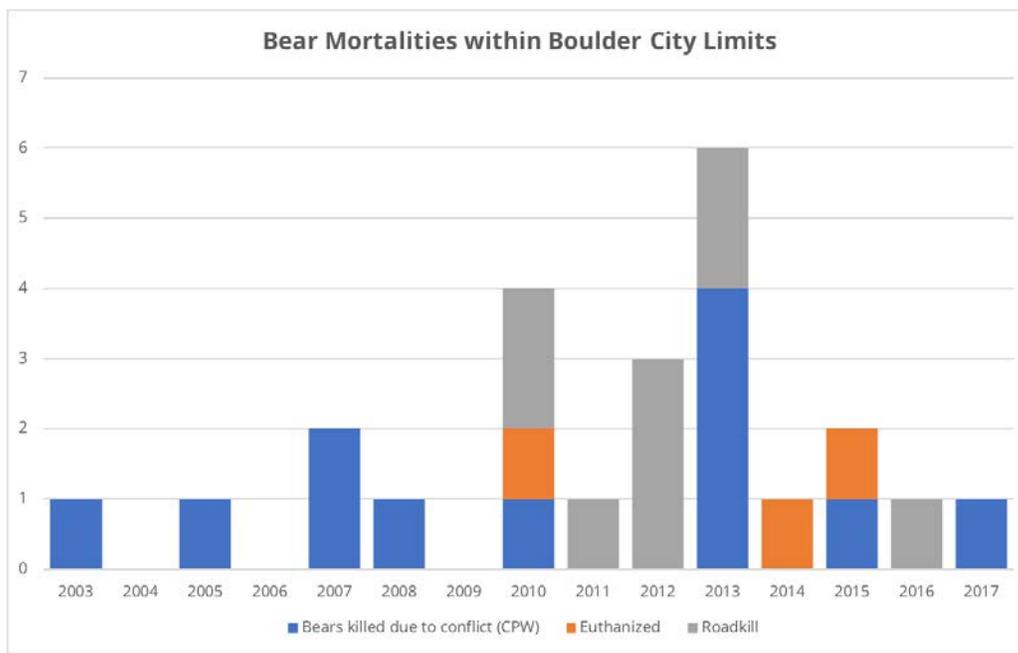


Fig. 1. City of Boulder bear mortality statistics 2003-2017.

Compared to other years, 2013 was a deadly year for bears, with four individual bears killed within Boulder city limits after becoming “nuisances” and habituated to trash, six bears requiring relocation, and two bears being hit by cars. According to CPW’s mortality reports, this is what happened to the bears that died in 2013:

- On **May 21, 2013**, one subadult male bear entered two different houses within a two-hour period in the city of Boulder. This brown-colored bear had no ear tags or strikes against him, but was however sighted numerous times with his sibling around the Columbia Cemetery. After being tranquilized, he was destroyed for posing human safety concerns.
- **September 8, 2013** kicked off a lethal month for bears. A large black-colored adult bear, #744, turned up in a backyard just west of Flatirons Elementary School. #744 was a very large, dominant boar, weighing in at about 590 lbs. The bear was quite old and wore many scars from fighting with other bears. He was a town regular and previously

required relocation after getting into trash, and here he was once again, getting into trash. This time he wouldn't leave and also caused damage to a resident's fence and was showing little to no fear of humans. He was euthanized at ~10 yards away; this was his 2nd strike.

- **September 14, 2013** brought wildlife officers to the Columbia Cemetery nearby 8th & Pleasant Street. Another repeat trash offender, #720 was an adult black-colored bear that had been relocated less than one month prior to his death. This bear reportedly allowed people to get very close to him to take pictures while he was eating garbage. Once #720 returned back to the city and continued to display nuisance behavior, he was euthanized; this was his 2nd strike.
- On **September 30, 2013**, another repeat trash offender, brown-colored sow #609 was euthanized after getting into trash in downtown Boulder. In October 2011, #609 received her first strike after showing nuisance behavior nearby University Hill, and was moved to Caribou Ranch Open Space. CPW notes that she returned to downtown Boulder within 6 days and was seen in town almost every day during the summer of 2013. She had two cubs with her when she was killed on September 30th, her 2nd strike. #609's orphaned cubs, one black-colored male, and one brown-colored male, were tagged as #719 and #721. The cubs were relocated to Kremmling, CO and #721 was destroyed by CPW in July 2014 due to conflict, while his sibling #719 was harvested by a hunter in September 2016.
- One common thread runs through these four bears killed in Boulder: they were eating trash.
- The two bears that were hit by cars within city limits did not have any previous strikes against them, so no other historical information is available. What we do know is the first bear was a male subadult and was hit by a car on May 10, 2013 on Diagonal Highway,

nearby the Cottonwood Trail. On October 11, 2013, a cub was killed by a car on south Foothills Parkway.

- Although it can't be said for certain, the incidents involving the three euthanized bears in September and the October 11th roadkill bear took place either during, or shortly after, Boulder's 2013 floods. From September 8-16, 2013, more than 18 inches of rain fell in Boulder, causing significant flooding, loss of life, widespread damage, and displaced wildlife in the area. It's also necessary to mention that the Bear Protection Ordinance was not yet implemented until 2014. According to Colorado Parks and Wildlife officer Kristin Cannon, issues with bears and trash had come to a head that year.

2015 was not as lethal of a year as 2013 was for black bears in Boulder, but in addition to the one bear that was euthanized, six individual bears required relocation that year. In a personal email, Kristin Cannon said to me that "2015 was as bad as some of our 30-year veterans had ever seen as far as conflict goes." Cannon explained that there was a late freeze that more or less eliminated the berry and fruit crop that year. She recalls one day where she dealt with seven different bears in town. On that particular day, CPW relocated a sow and her two cubs, plus another unrelated sow from south Boulder. At the same time, bearsitters were watching a bear in the Newlands neighborhood, when another bear began running around west Arapahoe Avenue. To top that off, another bear was sighted in the same vicinity of the sow and two cubs that CPW was in the process of tranquilizing and relocating.

Expanding bear mortality stats out to the broader Boulder County is rather challenging, as Matheson, an employee of the City of Boulder, is only able to track the city incidents. All conflict reports are tracked by Colorado Parks and Wildlife officers, however the agency does not have a user-friendly database system currently established. After receiving permission to spend a full day at CPW's Loveland, CO headquarters, I was able to dig up the following

conflict-related bear mortality data in Figure 2 from Boulder County. CPW data is organized in terms of Game Management Units (GMU), areas, and districts, not necessarily counties. As demonstrated in CPW's GMU map in Figure 3, the city of Boulder falls in GMU 29. The county, however, is divided between GMUs 20 and 29. Larimer County is also included in GMU 20, so that begins to complicate things as the forms are all handwritten hard copies and not necessarily sorted out by county. Also mixed in with the human-bear conflict paperwork are occasional mountain lion, moose, and mule deer reports. Considering the amount of time as well as the sheer volume of paperwork to sort through, I only managed to dig through statistics from 2013-2017. Due to the fact that some paperwork was out of order, I can say for certain that the Boulder County numbers should be viewed on an "at least" basis. There is a possibility more CPW-induced bear mortality reports exist, but may have been missed due to the system's current setup.

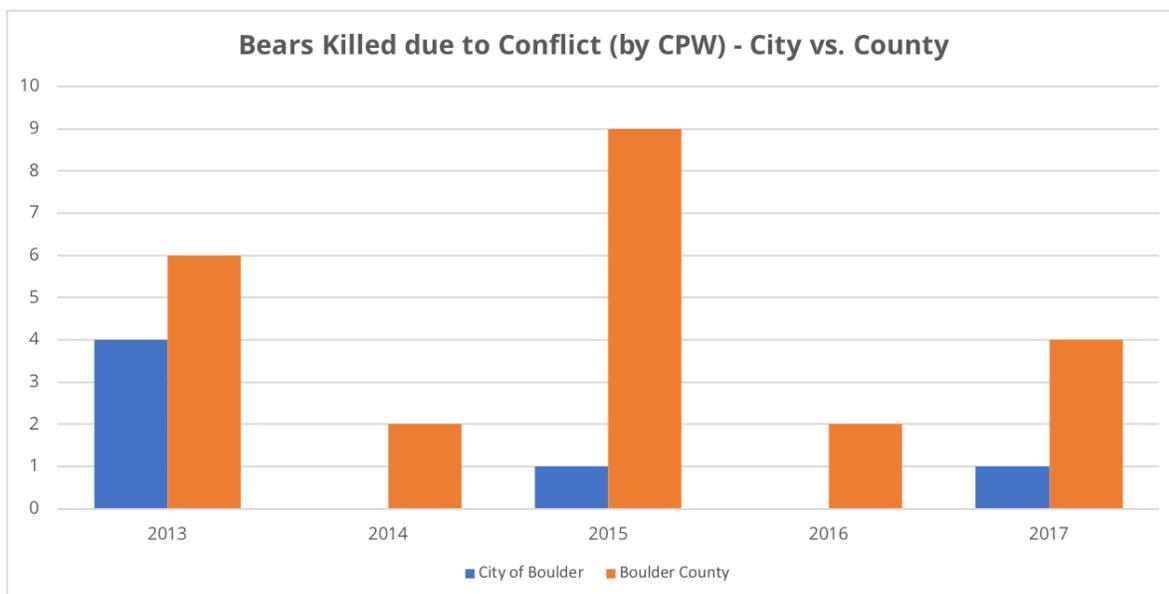


Fig. 2. Conflict-related bear mortalities by CPW in the City of Boulder vs. Boulder County.

County numbers include City of Boulder mortalities.

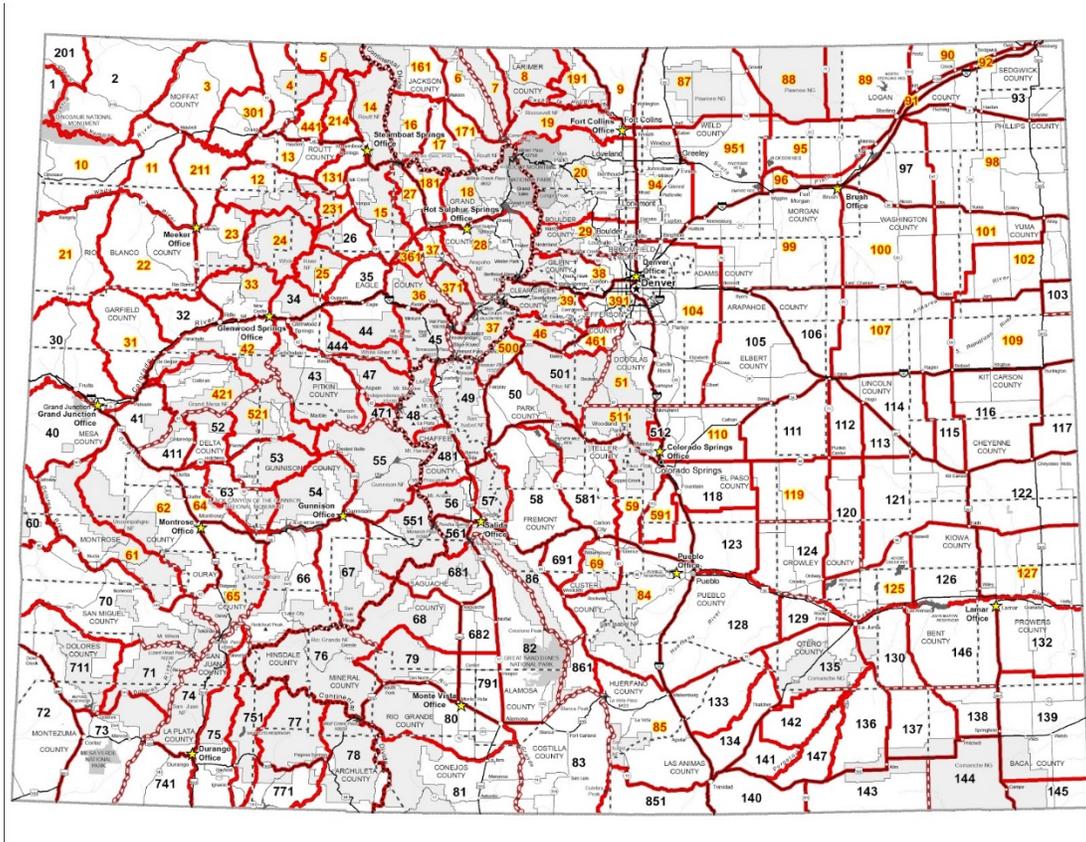


Fig. 3. Colorado Parks and Wildlife Game Management Unit (GMU) map.

Although there are not enough data available to demonstrate any obvious trends from year-to-year throughout Boulder County, I felt the data were still quite valuable. Even though years like 2014 and 2016 show zero conflict-related bear mortalities in the city of Boulder, there were bears that required lethal action just beyond that region, in the larger county. This is important to consider, as black bears have no concept of city or county boundaries. The moment a nuisance bear walks out of the city, into the wider county, and is destroyed, it will not be included in the city's database. That is not irrelevant, as nuisance bears have large territories, ranging upwards of 250 square miles, depending on available habitat and forage (Masterson 36). Bears killed throughout the county may have very well been a problem within Boulder's city limits before being destroyed in the county or elsewhere. It's also possible that the city's Bear Protection Ordinance, which requires residents west of Broadway and south of

Sumac Avenue to use bear-resistant waste bins, could be so successful that the bears are beginning to disperse further east. Draft maps of bear sightings, as provided by Valerie Matheson in Figure 4, do show that this may be the case. Failure to obtain the reward of garbage in west Boulder's bear-resistant waste bins may instead encourage the bears to continue on through the city, even out to areas as far east as Longmont. As seen in Figure 4, bears have indeed been sighted further east in 2017 versus previous years. While the 2015 sightings seem to be extremely high, it's important to note that this is the first year the city was able to incorporate call data from the Boulder Police Department's Dispatch line. It's not necessarily that 2015 had more bear sightings, but that the data collection efforts improved drastically. Also worth considering is the fact that these are not verified sightings, and some residents may choose to report bear activity while others will not.

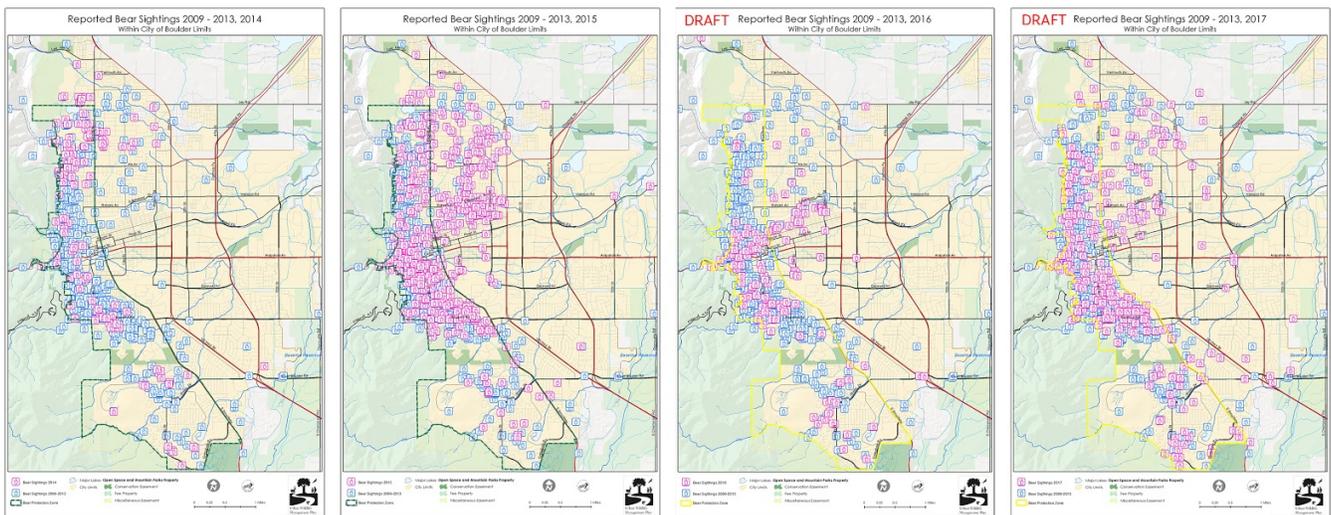


Fig. 4. Reported bear sightings within Boulder city limits. 2009-2013 in blue with bear sighting overlays from 2014, 2015, 2016, & 2017 (years after the Bear Protection Ordinance was implemented).

Additional bear mortality numbers dating back to 1995 were provided to me by CPW officer Kristin Cannon as a personal communication. This information is not yet published

anywhere and should be viewed as draft, unofficial records. This particular data, as demonstrated in Figures 6 and 7, is separated into two areas: the northeast region of Colorado, and the entire state of Colorado. Black bear mortalities are displayed in the following categories: CPW, landowner, ADC/APHIS (Animal Damage Control and Animal and Plant Health Inspection Service), and other. “Other” mortalities include roadkills, sheriff’s officers, hikers, carcass found, etc. Separate tables for each region are split up to specifically demonstrate how many roadkill deaths were in the “other” categories. “Other” and “roadkill” mortalities should be read on an “at least” basis, as these types of bear mortalities are not always reported to wildlife officials. It is likely that this number is higher in actuality. The City of Boulder and Boulder County are both included in CPW’s northeast region, as detailed by the Figure 5 map. Statistics for the northeast region as well as the entire state are included in my research to demonstrate the scale of conflict-related bear mortalities in a much larger sense, while still linking to Boulder’s city and county boundaries.

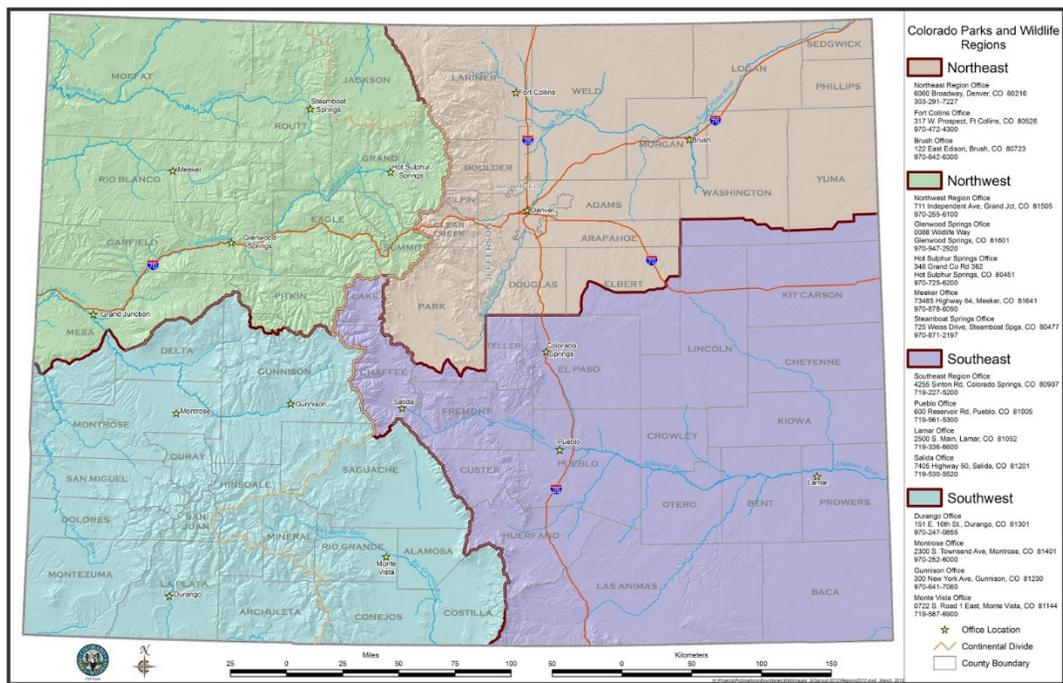


Fig. 5. Map of Colorado Parks and Wildlife regions.

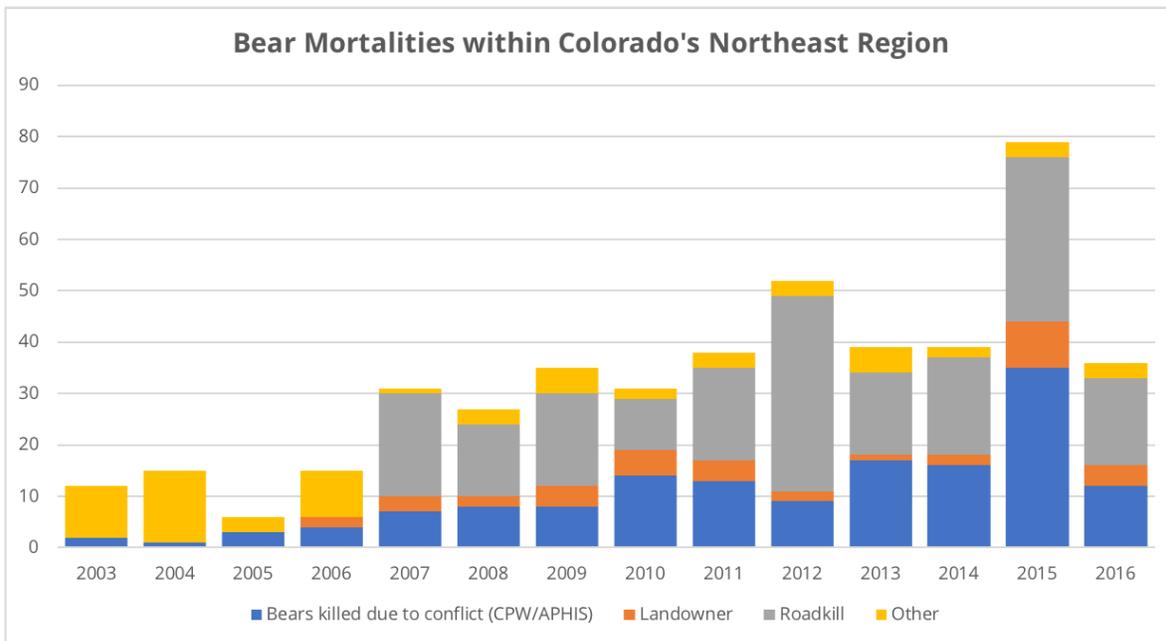


Fig. 6. Unofficial conflict-related bear mortality reports from CPW's Northeast Region.

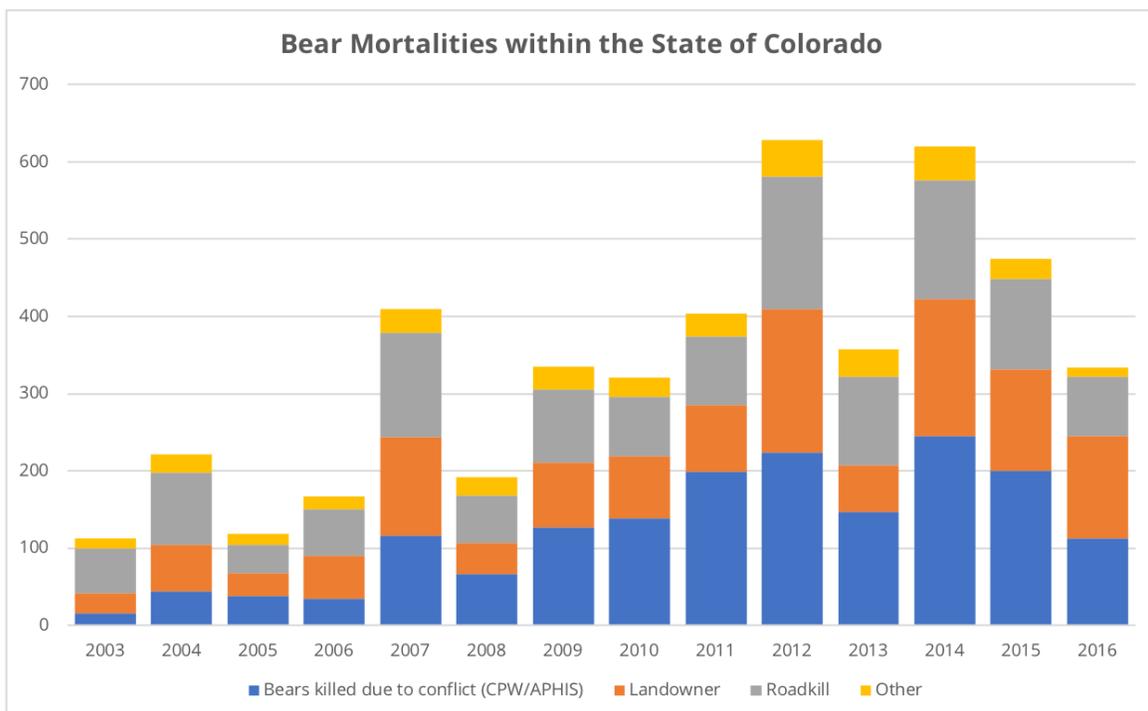


Fig. 7. Unofficial conflict-related bear mortality reports from the CPW statewide. Numbers include data from the northeast, northwest, southeast, and southwest regions of Colorado.

Unofficial reports from the northeast region of Colorado as well as the entire state of Colorado are broken out in Figures 6 and 7 to show the combined number of bears killed due to conflict by CPW and APHIS, bears killed by landowners as permitted by Statute 33-3-106 of Colorado's Nuisance Wildlife Laws, bear roadkill mortalities, and other mortalities. None of these statistics include hunter harvests. Similar to Boulder's city and county limits, bear mortalities do vary from year to year; however they appear to be following a general upward trend.

To explore the impact of urbanization on bear populations, a six-year study led by Colorado Parks and Wildlife concluded in 2017. According to lead researcher Heather Johnson, the study was motivated by the increase in human-bear conflicts throughout Colorado. "As the state wildlife agency that manages those conflicts, we wanted to better understand what was causing those conflicts to increase, and ultimately what we should do about it," said Johnson (Cohn). CPW handled over 600 unique bears found roughly 6 miles around Durango, CO, and used GPS collar technology and hair-snare surveys to monitor bear activity and population trends. Although the full report is in progress, the initial findings are expected to inform a smarter approach to bears. Highlights from a July 2017 article about the study state that

Bear-human conflicts do not necessarily mean the bear population is growing but that bears are adapting to take advantage of urban expansion. Bears that eat human food do not become addicted — contrary to long-held beliefs that have justified a two-strikes policy of euthanizing "food-conditioned" bears. Rising temperatures around dens and urban development in bear habitat shorten bear hibernation, leading more bears out more often, potentially increasing clashes with people. Colorado's bear population could decline. In southwestern Colorado

around Durango, where researchers studied 617 bears starting in 2011, the female bear population decreased by 60 percent. (Finley)

The Durango study is extremely relevant, as warming temperatures throughout the state are indeed leading bears out of their winter dens earlier in the year. Of course, not every bear will be seen by the human eye, but a Durango Herald article showed the first bear sighting from the area this year took place on March 8, 2018 (Romeo). In the article, Bear Smart Durango's Bryan Peterson said additional reports of bear activity are continuing to roll in. In 2017, the first bear was seen on March 27th, and that was the only bear sighting of the month (Romeo, 2018). CPW's Kristin Cannon reported to me in a personal email that she received the first notification of a bear sighting (a bear and small cub) within Boulder city limits on March 15, 2018 nearby the Royal Arch open space trail by an Open Space and Mountain Parks employee. Cannon felt quite certain that this was the earliest a bear had been spotted in Boulder upon leaving its winter den. After following up with Valerie Matheson, the following "first sighting" dates were shared with me: April 13th and May 8th in 2015; April 28th and May 18th in 2016; and March 22nd and 23rd in 2017, and as stated above, March 15, 2018. Based off these past four years, Boulder does appear to be following the early den departure trend.

Moving forward, it's necessary to understand that conflicts between humans and bears will continue unless people take action to proactively secure attractants from the bears and practice safe hazing techniques. Educating residents, implementing policies, and enforcing those policies is not the responsibility of one single agency or organization, but should be a cooperative effort involving the city, county, state, and citizens. In its 2015 *Human Bear Conflict Report*, CPW states that

Going forward, it is critical to keep in mind that all credible research and practical experience suggests that efforts to reduce bear populations alone will not reduce

human conflicts. To address this problem effectively, simultaneous efforts must be made to influence human behavior and practices, including improvements to waste management methods and enacting and strictly enforcing effective local ordinances. (5)

UNDERSTANDING THE BLACK BEAR

Providing background on the black bear as a species is necessary for setting the animal up as an identifiable victim or character. The goal is to share this information in a way that readers will want to protect the bear. However, for those that tend to be rather apathetic or non-supportive of the species, having this overview available will allow them to better understand bears and how to appropriately respond to any potential interactions. Background is provided on a bear's basic biology, survival needs, behavior, and more. Understanding a black bear's needs and behaviors is an essential part of reducing negative interactions. Much of this information is based off research provided by Colorado Parks and Wildlife, as well as Linda Masterson's *Living with Bears Handbook*. For example:

The American black bear (*Ursus americanus*) is typically a cautious creature, whose normal response to any perceived threat is to run away. They're found throughout North America and in at least 40 U.S. states, ranging from northern Mexico up to Canada, and from the west coast of California to eastern Maine. Historically, these omnivores roamed throughout almost all of North America's forested regions, however a growing human population has limited black bear populations to the forested areas that tend to be less densely occupied by humans (Defenders of Wildlife).

Black bears are classified as carnivores, but "omnivore" seems to be a more fitting description since about 90% of their natural diet consists of mainly nuts, berries, young

grasses and leafy forbs. The other 10% comes from scavenged carcasses and insects. They are opportunists, so when they have the chance they will also kill smaller mammals such as young deer, elk, or moose calves. These ursines are extremely powerful animals, with jaws strong enough to crunch through deer bones, limbs that can flip over a 100-lb boulder in search of food, and short claws that allow the large bears to tear apart logs and effortlessly climb the tallest of trees. Although they are able to reach speeds of up to 35 mph during short sprints, their bodies are mainly built for strength and endurance, which allows them to set out for long daily journeys of up to 5-15 miles (Masterson; ch. 3). Each bear is different, but they all have the same thing on their minds: food, shelter, reproduction, and avoiding danger. During late summer and fall, black bears enter this phase of intense eating, called “hyperphagia.” The bears need to gain about 3-5 lbs. each day, which on the high-end evens out to the animals spending up to 20 hours a day foraging so they can eat roughly 20,000 calories on a daily basis. If you think about that in terms of the average human, 20,000 calories is enough food to last the average woman for 9 days. The fat reserves gained from this constant state of foraging is necessary for their survival, and the bears won’t head out to their winter dens until they’re able to fully bulk up. Colorado black bears will hibernate anywhere from early November through April, sometimes up to 6 or 7 months, and during that time they won’t eat, drink, or defecate.

GETTING TO KNOW LOCAL STAKEHOLDERS

Throughout the past three years, I’ve seen firsthand that there are many individuals and organizations involved with black bear efforts in Boulder. Overall, there are three main groups that provide constant leadership: Colorado Parks and Wildlife, the City of Boulder, and Boulder Bear Coalition. Each of these groups has their own goals and roles when it comes to the urban

bear interface, but here in Boulder it essentially comes down to reducing human conflicts with bears and promoting peaceful coexistence.

The mission of Colorado Parks and Wildlife is to “perpetuate the wildlife resources of the state, to provide a quality state parks system, and to provide enjoyable and sustainable outdoor recreation opportunities that educate and inspire current and future generations to serve as active stewards of Colorado's natural resources.” This government agency is responsible for conserving wildlife and habitat to ensure healthy sustainable populations and ecosystems exist throughout the state, and also locally in Boulder. CPW's District Wildlife Manager for the Boulder North District is a woman named Kristin Cannon. Kristin has been with CPW since 2007, and in her current role since 2009. Her district is larger than just Boulder County, and she covers an area from I-25 west to the Continental Divide, between Highway 52 and Highway 7, and Lefthand Canyon to Boulder Canyon. Her role is to serve as the game warden for her region and she spends roughly a third of her time on law enforcement, a third on education efforts, and a third as a biologist. Much of her efforts are spent on wildlife conflict, specifically with black bears, mountain lions, coyotes, or moose. Kristin provides many opportunities for residents to get involved, ranging from the collaborative Bear Aware program with Open Space and Mountain Parks, a volunteer coyote crew in Erie, CO, and by facilitating an email group where she updates residents on local wildlife activities. She does her best to be open and transparent about her efforts, which have helped her gain the trust of the community.

Recognizing the close proximity to the mountains and open space, the City of Boulder brought Valerie Matheson on as the city's first Urban Wildlife Conservation Coordinator. Not only is this a first for Boulder, but it very well may be a one-of-a-kind role for any American government municipality. Originally this work was covered by a team of city staff from five different departments, which ultimately proved to be inefficient for each person to take 10-20%

of their time to work on urban wildlife related issues. In 2009 Valerie was brought on to help the city become more proactive and consider ways to better coexist with wildlife and limit lethal control where possible. She spends about 25% of her time on permitting, 25% on policy and plan development, and the remaining 50% is dedicated to project management and implementation. Considering Boulder is located in between the Rocky Mountain foothills and the western plains, in addition to black bears, mountain lions, and coyotes, Valerie spends a portion of her time on prairie dog concerns. Boulder has an extremely engaged community, which tends to be a bit of a blessing and a curse for public servants, so much of the Urban Wildlife Conservation Coordinator position is centered around creating policy around community concerns and managing those expectations.

The Boulder Bear Coalition is a nonprofit organization that was founded in 2012 by a woman named Brenda Lee for the sole purpose of protecting local black bears. This volunteer-led nonprofit aims to create community-based solutions to human-bear conflicts in Boulder and has become a trusted community voice for wildlife among residents. After moving to Boulder in 2008, Brenda was disturbed by the lethal actions taken against bears on almost an annual basis within Boulder's city limits. Her story is a powerful example of a concerned member of the community stepping up to take leadership and work alongside the community and local government to create meaningful change. Since its inception, Boulder Bear Coalition helped the City of Boulder pass the Bear Protection Ordinance, became a founding member of the Community Fruit Rescue, created collaborative and innovative solutions to reduce conflicts with bears, and provided extensive guidance and education around how to live with black bears. Brenda spends much of her time researching new opportunities for black bear coexistence, managing volunteers, searching for funding, and providing oversight to local policy and management of bears.

Recognizing the outstanding efforts these three main stakeholder groups take to reduce human-bear conflicts in the region, my project strives to support their efforts by promoting their work. This website will serve as one central repository of information that caters to the everyday person, who may not have a strong understanding of black bears or other wildlife. Telling the unique stories of Kristin, Valerie, Brenda, and their respective groups will help to inform the general public of their passions and dedication. It's far too simple to make assumptions or place judgment on a situation that one may not know much about. My hope is to put a face to each of these names and organizations so individuals will take time to understand the full picture.

ENVISIONING BOULDER, COLORADO

Located in Colorado's Front Range, Boulder is a gorgeous mountain town brimming with wild nature. Here, the western Great Plains greet the eastern foothills of the Rocky Mountains. This region has some of the most diverse wildlife populations in all of Colorado, with over 100 breeding bird species, more than 200 types of butterflies, at least 64 species of mammals, and countless reptiles, amphibians and other insects.

Also in abundance in Boulder: humans. Similar to many cities in Colorado's Front Range, Boulder is experiencing a rapid human population growth. In the past 10 years alone, Boulder has grown from a population of 98,305, and steadily increasing to over 108,000 today. Boulder is best known for its active, outdoorsy lifestyle, expansive open spaces and recreational areas, progressive politics, a booming startup company culture, and don't forget about the 300+ days of sunshine each year. It's also home to the University of Colorado, which welcomes roughly 33,000 students to its campus each year.

Because Boulder takes such great pride in its natural landscape, the City of Boulder made the preservation of its natural areas and mountain backdrop a priority. In 1967, Boulder

became the first city in the United States to implement a tax that would protect the area from massive population growth. The 0.40 of a cent sales tax was implemented specifically to allow the city to buy, manage, and maintain open space. More than 50 years later, the city of Boulder has preserved and protected over 45,000 acres of land. This includes 151 miles of trails, wildlife habitats, and unique geologic features (OSMP Department Information).

Keeping up this impressive landscape is no easy task. In addition to Boulder's increasing population, the city's Open Space & Mountain Parks see more than 5.3 million human visits per year, based off a 2014 estimate. Consider this in comparison with the nearby Rocky Mountain National Park, which received 3.4 million visits that same year, or Yellowstone National Park's 3.5 million visits, and one may worry that Boulder's open spaces are being loved to death. Balancing human recreation opportunities with land and wildlife preservation is no easy feat.

For some species of wildlife, Boulder's strong human presence leaves them with no other option but to adapt to the changes, or retreat. Fortunately for the black bear, the animal's omnivorous diet has allowed it to adapt to urban life quite well. That goes without saying that their ability to roll with the punches also unravels numerous other concerns that fall under wildlife protection and community safety.

EVALUATING THE BOULDER COMMUNITY

To learn more about locals' experiences living with, and values of, local black bears, I solicited community feedback from individuals residing within Boulder County from February 17 - March 11, 2018. All human subjects research was carried out in full compliance with the University of Colorado Boulder's Institutional Review Board. In order to get a stable base, my goal was to receive at least 200 responses. I created flyers that I posted in local businesses

such as coffee shops, restaurants, bookstores and auto repair shops. Social media graphics were created to be shared alongside messages on NextDoor neighborhoods, Facebook posts, neighborhood email listservs, and with personal emails. I ended up with 368 overall respondents, leaving me with statistically significant sample sizes for the majority of my questions. The questions were optional, and of the 327 people who answered the question asking how they found out about this survey, 89 came from Facebook, 60 from online neighborhood groups like NextDoor, 59 from email, 28 from friends or family members, 22 from my personal requests, and 18 came from other options like Craigslist or the respondent's place of work. The remaining 60 came thanks to a Daily Camera article that reporter John Bear wrote about my survey and overall thesis project (Bear). At the time of survey completion, 65% of respondents said they were currently living within Boulder's city limits, and ages ranged from 18 years old to over 75 years old.

Which city or township do you reside in?

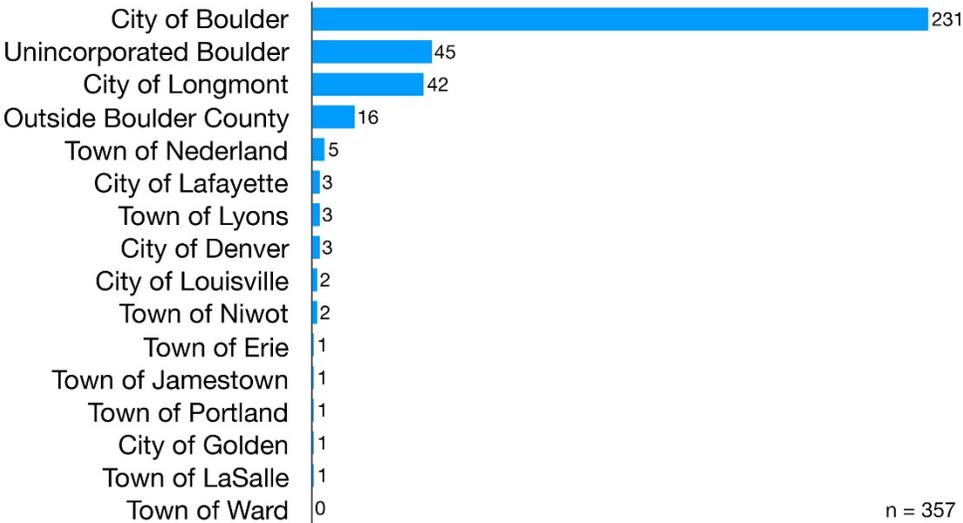


Fig. 8. Respondents' current location of residence.

Snowball sampling was expected and considering I would be unable to prevent any bias from taking place, I added a question at the end of the survey that would attempt to measure that potential bias. The question asked respondents, “Are you a member, volunteer, or employee of any wildlife-related groups? This could be anything from a non-profit organization such as the Sierra Club, a government agency such as Colorado Parks & Wildlife, or a community group created by local residents.” Of the 331 individuals that answered this question, just 24% answered yes. When asked to list the groups they belonged to, 46 individuals said they belonged to a nonprofit organization that worked in some way to protect wildlife, for example the Sierra Club, The Nature Conservancy, WWF, or Boulder Bear Coalition. 11 belonged to Boulder City or County Open Space, 2 to Colorado Parks and Wildlife, and the remaining 10 were a mix of recreation-centric groups such as Backcountry Hunters and Anglers or Trout Unlimited.

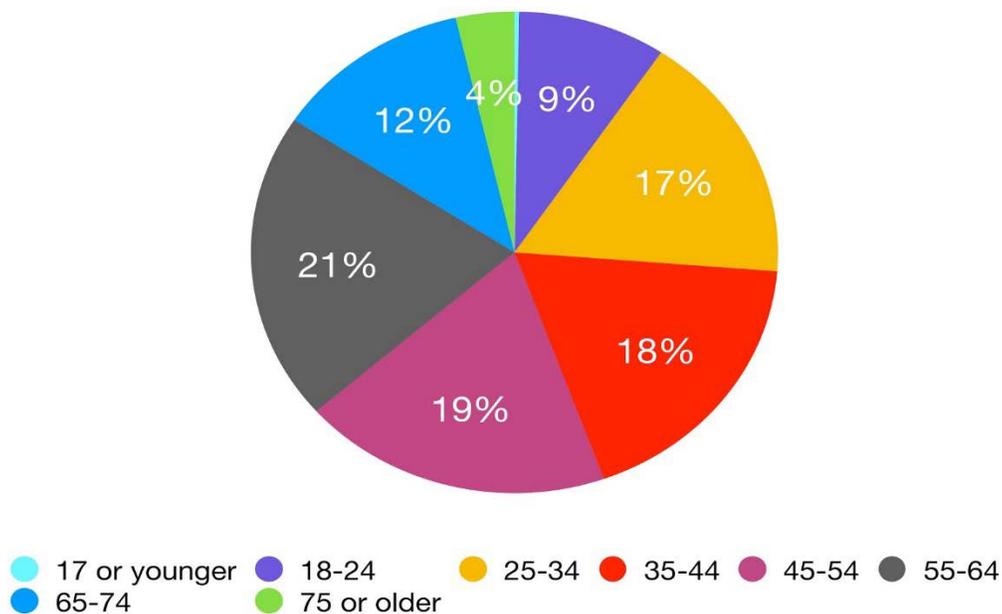
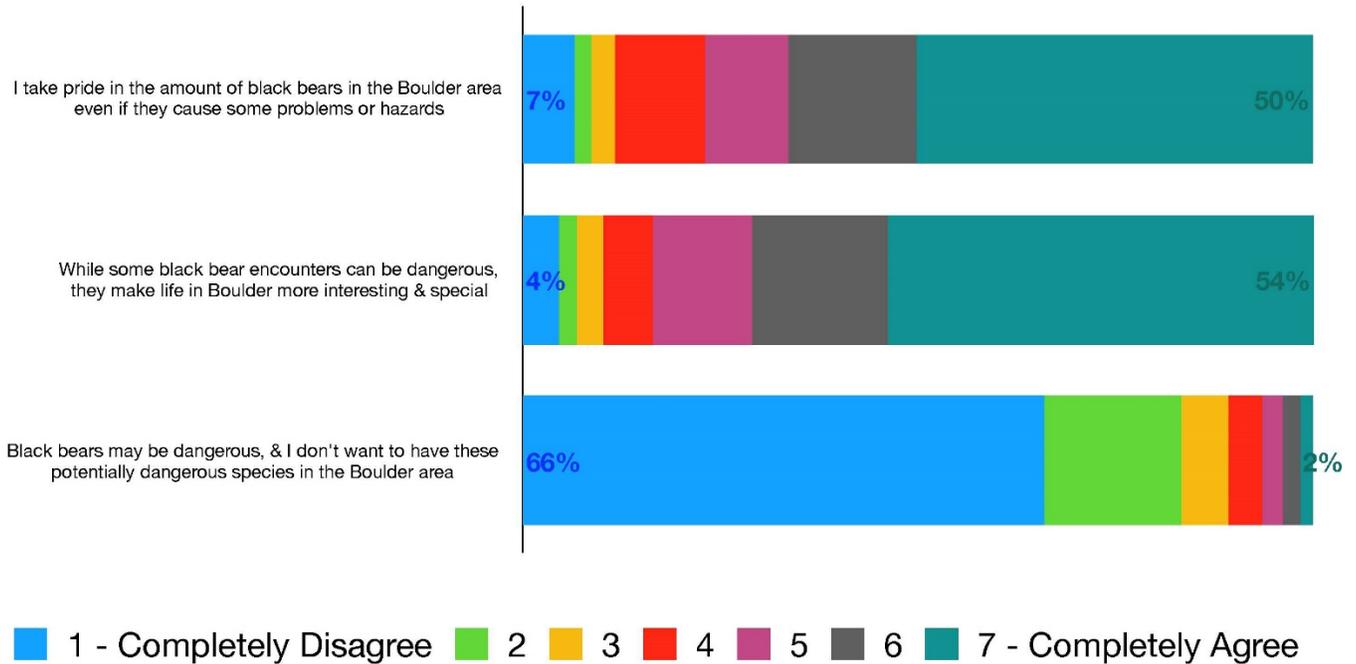


Fig. 9. Respondents' age.

Survey data did in fact confirm my beliefs that the Boulder community was rather tolerant, supportive, and placed high value in black bears. To gauge tolerance levels, three specific questions were modeled after an Anchorage, Alaska survey which sought to determine residents' opinions on and tolerance levels of local bear and moose populations (*Anchorage Residents' Opinions on Bear and Moose Population Levels and Management Strategies*). When asked how much the respondent agreed with the following statements on a scale of 1-7 (1 = I completely disagree, 7 = I completely agree), the results of 334 people came in as displayed below in Figure 10. The majority of people take pride in living with black bears or find living with black bears to be interesting or special, even if they may be dangerous, cause problems, or are hazardous. Additionally, two thirds of respondents completely disagree with the statement "Black bears may be dangerous, and I don't want to have these potentially dangerous species in the Boulder area." In a separate question, I asked if survey respondents had ever had a negative interaction with a black bear, 93% of the survey takers answered no. Initially I expected this number to be higher, but realized in addition to truly not experiencing negative interactions, that residents could also be saying no simply because they wanted to protect bears if there was a prior conflict. Or, because they may not perceive incidents like bears getting into their trash bins to be negative at all. This especially would back up the questions from Figure 10 that demonstrates residents have a high tolerance of black bears.

On a scale of 1-7, how much do you agree with the following statements:



n=334

Fig. 10. Black bear tolerance in Boulder, Colorado.

Similar to the three tolerance questions, I asked another question to find out what residents' levels of comfort were in regard to bear activity throughout various areas in the state, ranging from in a person's yard, in a person's neighborhood, in Boulder's urban areas, in the surrounding foothills, on and/or around Boulder's hiking trails, in Boulder County, and in the state of Colorado. In Figure 11, 333 respondents answered on a scale from 1-7 for each region, where 1 is not comfortable at all, and 7 is extremely comfortable. As expected, individuals felt more comfortable with bears being in the state of Colorado. The gap began to narrow as the areas became a bit smaller and closer to the individuals. Respondents still felt quite comfortable with bears in Boulder County, the surrounding foothills, and on or around

Boulder’s hiking trails, but comfort levels changed as they answered the questions about bears in neighborhoods, urban areas, and yards. Overall, at least half or more of the respondents selected a 4 or higher for the options closer to human communities. As I discovered from personal emails sent to me from survey takers, some individuals told me they felt black bears were fairly peaceful creatures and posed no threats to humans. They truly felt safe among the presence of black bears even in their own yards and thought the animals should be left alone. Another person emailed me saying her responses to this question were skewed because she responded with “somewhat uncomfortable” based on her personal fear that the bears will be injured by the people who live there. This particular individual had experience with black bears and said she trusted bears more than she trusts humans. Given responses like this, I feel it would be valuable to design a follow-up survey that asks respondents to provide reasons as to why they answered the way they did.

How comfortable are you with living with black bears in the following areas?

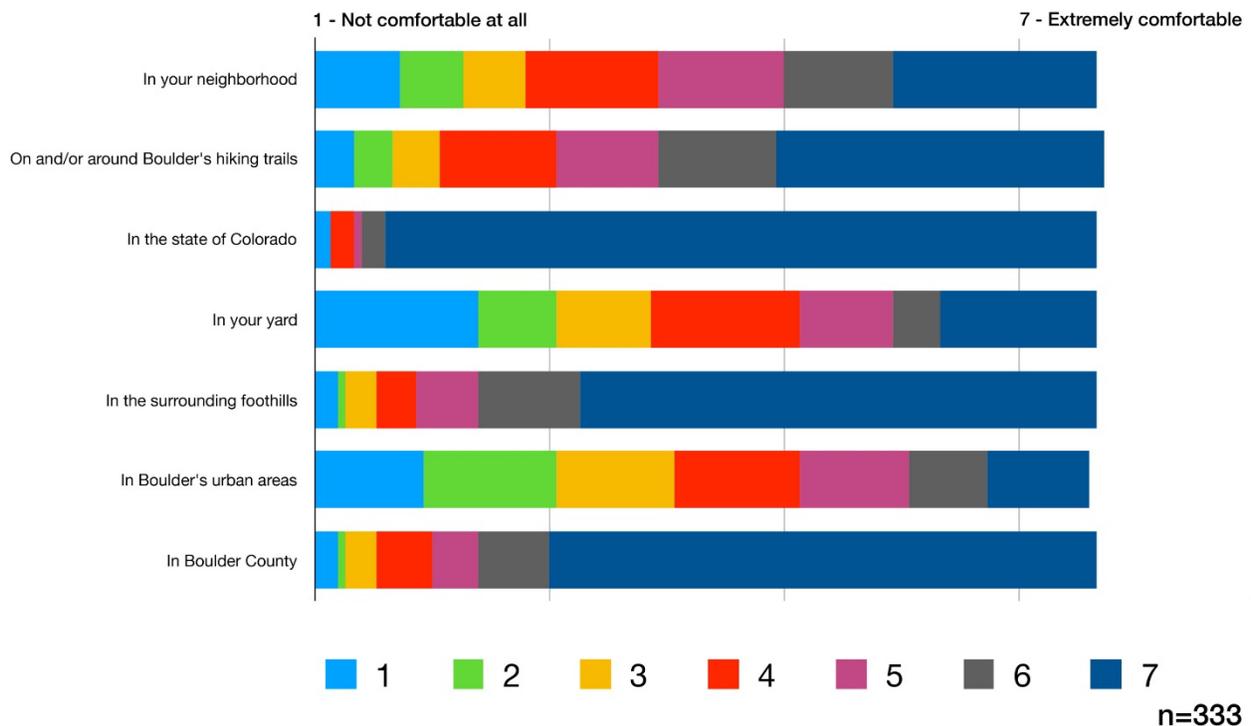


Fig. 11. How comfortable are you living with black bears in the following areas?

Additionally, respondents were very supportive of expanding the Bear Protection Ordinance. In Figure 11, over 60% of the 345 people who answered this question said the ordinance should be expanded to wherever there is documented and ongoing bear activity, while 30% said it should be expanded to wherever the City of Boulder deems appropriate. Combined, that means over 90% of that question's respondents would like to see the Bear Protection Ordinance expanded to some extent. This particular data is proving to be incredibly useful and timely, as the City of Boulder's Urban Wildlife Conservation Coordinator is in the process of writing a memo for City Council in hopes that the ordinance can be expanded in the future. In addition to Figure 11, Valerie Matheson will be utilizing basic demographic data in her memo to emphasize the local support for Boulder's Bear Protection Ordinance.

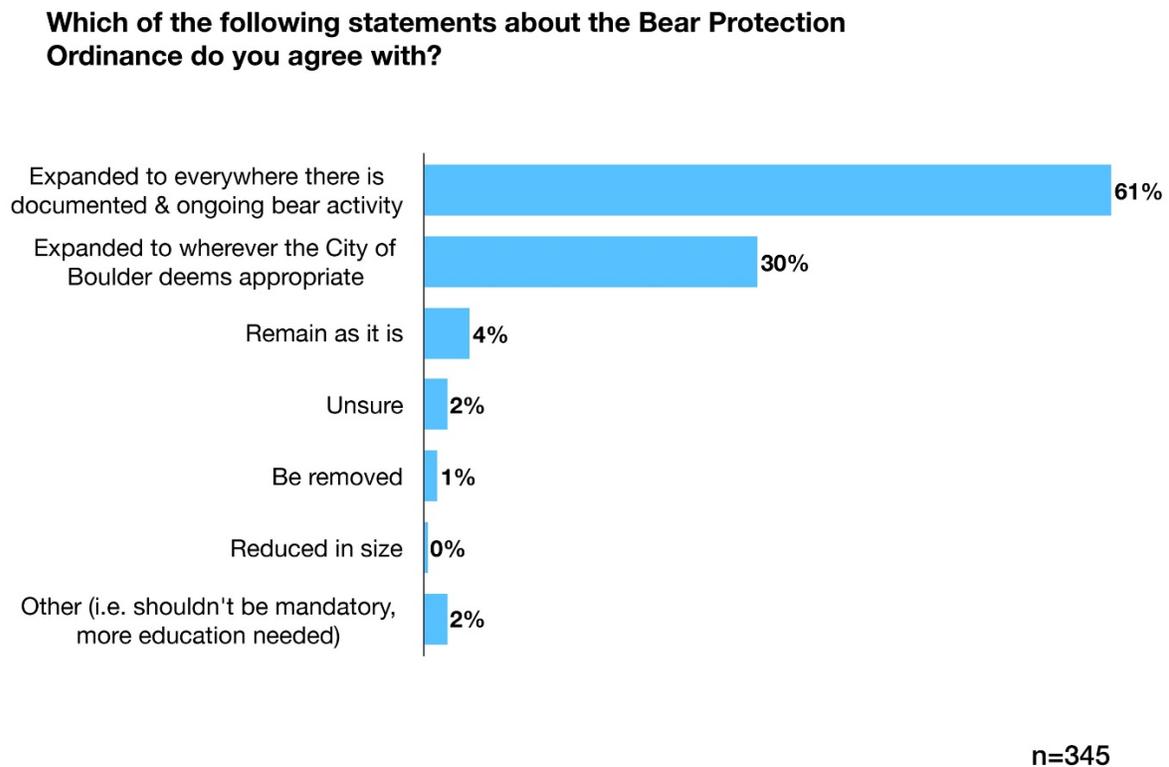


Fig. 11. Which of the following statements about the Bear Protection Ordinance do you agree with?

Another interesting finding was in the question which asked for feedback about the Colorado Parks and Wildlife 2-Strike Policy. When nuisance bears are killed in Boulder, many residents have expressed their disdain for the lethal management actions that occur. Emotions run high and individuals share their concerns in numerous digital platforms such as letters to the editor (see two examples from Arvey and Theall in the Works Cited section), newspaper article comment sections, social media, and neighborhood listservs. To gain a stronger understanding of residential support around the 2-Strike Policy, I asked survey takers to select which of the following statements they agreed with. In Figure 12, of the 332 respondents, more than 50% said they'd like to see looser, or no, penalties for bears. 25% felt wildlife officers should have the ability to take action as they see fit. This specific option reflects on the respondents' trust in the wildlife officers, as well as an urge for regional wildlife officers to treat incidents on a case by case basis instead of conforming to a statewide policy. Numerous respondents followed up with me either via email or in the survey question's write-in option to provide further clarification to that point. [A full report of the survey findings can be found here.](#)

Which of the following statements about the 2-Strike Policy do you agree with?

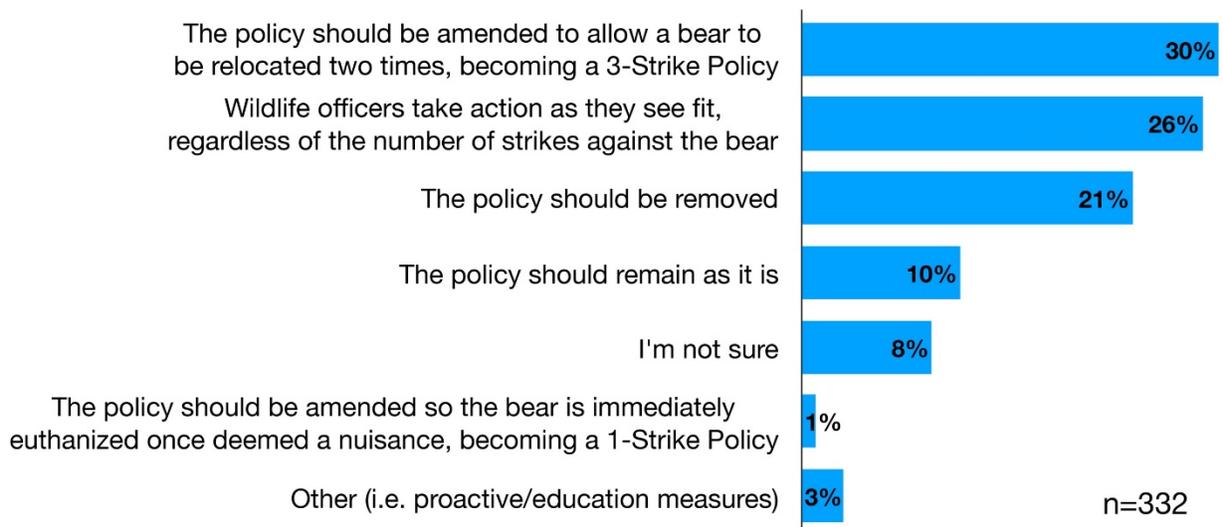


Fig. 12. Which of the following statements about the 2-Strike Policy do you agree with?

BOULDER'S PROBLEM WITH PEOPLE, NOT BEARS

One might say that the Boulder community is rolling out a red carpet for bears. Not even just bears, but other adaptable species such as coyotes, red fox, raccoons, mule deer, and even mountain lions. Here in Boulder, numerous attractants serve as an open invite into town for animals like these. Western Boulder neighborhoods in particular provide wildlife with a quick commute from the foothills to a rather extensive menu: ripe fruit, bird feeders, pet food, greasy outdoor grills, unsecured trash, and for the bolder species like mountain lions and coyotes, small livestock and off-leash pets.

Black bears are opportunists. The majority of their natural diet is plant-based, but in an urban landscape, anything goes. Bears that reside nearby human communities will often meander into town in search of the easiest, fattiest foods. They want to burn the least amount of energy possible in order to consume the highest number of calories. In her *Living with Bears Handbook*, Linda Masterson explains that in order for a bear to get those necessary 20,000 calories a day, he or she would need to eat 672 acorns, 78 pounds of blueberries, nearly 25,000 tent caterpillars, or ONE 7-pound bird feeder filled with black oil sunflower seeds (23). If you were the bear, would you want to spend your energy foraging all day long, or would you meander through town for some easy human-provided food?

In Boulder's urban areas, the most popular place for a black bear to find food is in a person's trash or compost bin. It doesn't matter how much "food" is actually in the bin: if it smells like food, then the bears will sniff it out. Bears that break into a person's waste bins aren't subtle; one might hear them knocking the cans around and tearing bags apart in search of tasty treats. After the damage is done, residents will find their trash strewn all over the place,

with paw prints or claw marks present, and bear scat nearby. Other animals such as raccoons, coyotes, and even Norway rats are also drawn to these areas thanks to the easy meals they provide.

Other attractants that prove to be popular for black bears are things one may not even consider. In Boulder specifically, bears tend to make frequent visits to residents' bird feeders and unharvested fruit like apples, pears, chokecherries and plums. Additionally, items like beehives, backyard chickens, and even goats will serve as easy meals. Beyond food, cities also provide shelter for wildlife, and an escape from rivaling animals. Considering that black bears prefer to be solitary creatures, they try to avoid any overlap of territories. Sometimes that escape is in a person's quiet backyard, or at the top of a neighborhood cottonwood tree where they can snooze the day away. Allowing bears to feast and rest in urban areas may seem harmless, but in reality a number of consequences come into play.

THE CONSEQUENCES

Black bears are risk-avoiders and try to steer clear of danger at all costs, but regardless of their shy demeanor, one must remember that black bears are very large, strong, and *wild* animals classified as carnivores. Healthy adults can weigh anything from 100 to more than 600 pounds. It all depends on the time of year and their available food and habitat, but males weigh 180-300 lbs and can measure from nose to tail 6 feet or more long, and stand 3 ½ feet high. Females typically weigh anywhere from 120-250 lbs, and range from 4 ½ to 5 feet long, standing roughly 3 feet high (Masterson 37-38). Black bears rarely show aggression towards humans, and we want to keep it that way. When a person makes him or herself look big and makes a lot of noise, the bear should run away. We want these large omnivores to maintain their natural fear of humans so they will steer clear of us and act like wild bears.

A FED BEAR IS A DEAD BEAR

The moment a black bear loses its anthropobia, or fear of humans, is the moment conflicts arise with people. "Habituation" occurs when a bear becomes accustomed to urban life and making a regular diet out of human-provided foods such as trash. When a bear becomes habituated, it no longer sees humans as a threat, and it can become aggressive. Colorado Parks & Wildlife, the government agency which manages all wildlife throughout the state, implemented a statewide "Two-Strike" Policy as a way to manage black bears and keep human communities safe. Here's how it works:

Strike 1: Tranquilize - tag - relocate

A bear that appears in an inappropriate location (for example, too far into town) or engages in episode(s) of "nuisance" behavior (multiple visits to town, light property damage, etc.), will be tranquilized by wildlife officers, ear-tagged, and relocated to another area within the state of Colorado.

Strike 2: Euthanization

If that same bear has to be physically dealt with again (tranquilized or trapped due to inappropriate location or nuisance behavior), the bear is killed. It doesn't matter where the bear is found: if it's getting into trouble anywhere else throughout the state, it's an automatic death sentence for the bear. Bears that pose a public safety risk will be put down regardless of whether they have ear tags or not ("Inquire Boulder: Bears").

It's a tough call for wildlife managers to make. In communities like Boulder that have a high tolerance of wildlife, officers do their best to avoid having to handle a bear in the first place to give the animal a better chance of survival. Unfortunately for bears that may just be a

little turned around and find themselves deep into a city area, any physical action taken on the bear counts as the first strike.

Relocation is tricky, too. Unless some type of special permission is received, black bear relocations must take place within the state of Colorado, and they typically need to be at least 50-100 miles away from where the bear was captured (*Human Bear Conflict Report 16*). Otherwise, and this often still does happen, the bruin will come right back to their home range thanks to their exceptional memories and sharp noses. Juvenile bears tend to have the best chance of successful relocations, as they don't have an established home range to return to. This is certainly true in the Boulder North District, where CPW District Wildlife Manager Kristin Cannon told me via email that she does have updates for many of the bears CPW has relocated, and "a majority of adult bears were killed on a second strike after being involved in additional conflict, some were hit by cars, but most of the subadults we didn't hear from again (whether because they died or stayed on the natural landscape is hard to say)."

A 2015 study led by CPW biologist Mat Alldredge aimed to evaluate the effectiveness of translocations as a tool for reducing human-bear conflicts in South-Central Colorado. Alldredge and his team found that translocation of problem bears had mixed success relative to repeat nuisance activity in Colorado, but should remain a viable management option. They felt "managers should make decisions on the appropriateness of translocation based on the characteristics of the bear, identification of an adequate release site, potential effect of the translocation on the release-site bear population, and other available options." Additionally, Alldredge found that

Successful establishment of home ranges by conflict bears at the translocation site appears to be influenced by the age of the bear at the time of translocation and perhaps its gender. In South-central Colorado, compared with adults,

subadults were less likely to orient toward the original capture site, moved shorter distances from release sites, and did not return to capture sites ...

Consequently, translocated subadult males may not exhibit homing tendencies because their home ranges have not been established. Adult bears appear to be strongly motivated to home, probably because of the fitness benefits of the home range. (Alldredge et al. 5)

Black bears are found throughout the state of Colorado, so it's important to remember that each county has its own bear populations to manage. When a bear is relocated, it may be dumped in another bear's territory, get hit by a car, or become another region's problem bear. Though it certainly has been a powerful management tool and proved successful for many bears, relocation is a reactive management strategy and does not address the larger reasons behind these conflicts.

It should also be noted that eating trash can be extremely harmful for these ursines. While digging into trash, bears also consume plastics, foil, and other non-digestible, potentially toxic materials. In Boulder specifically, an adult female bear was euthanized in May 2014 upon being found lethargic and unresponsive. Upon necropsy wildlife officers found the bear had somehow consumed antifreeze, which caused organ failure. Similarly, in September 2013, a sow with a cub had consumed rat poison. For another bear that was destroyed in the same month after becoming habituated to eating trash, necropsy results found the bear's stomach contents to full of trash (Unofficial mortality reports from Colorado Parks and Wildlife).

COMMUNITY SAFETY, PROPERTY DAMAGE, AND PUBLIC HEALTH AND SANITATION

In addition to black bears being euthanized from Colorado's 2-Strike Policy, habituated bears pose some major concerns for human communities. Keeping in mind these are large,

wild, carnivorous animals, habituated bears may become aggressive and potentially harm a person. According to Boulder's Urban Wildlife Conservation Coordinator, elderly residents and families with young children are especially concerned about physical encounters with bears that make their way into urban areas. Physical encounters with black bears are extremely rare, but not unheard of. In the state of Colorado, only three black bear fatalities have been documented, with the most recent encounter being in Ouray, Colorado in 2009. A 74 year-old woman had reportedly been feeding bears on her property, when one later on mauled her to death (Brown).

No black bear related fatalities have been documented within Boulder County. However, in 2017, a 19 year-old camp counselor awoke with his head inside a black bear's mouth while he was sleeping outdoors in Ward, Colorado (Bounds). The bear dragged the young man roughly 12 feet before he was able to fight it off and safely get away. This goes to show that although these encounters are quite few and far between, they are still worthy of concern. Black bears tend to be rather cautious animals and will avoid humans at all costs, but there's no telling what could happen when a bear becomes habituated to urban life and loses its natural fear of humans.

Property damage is another concern when black bears wander into human properties. Beyond breaking into trash bins, their strong noses will lead them to other attractants found in a person's backyard, shed, garage, car, and even inside their home. Bears are extremely intelligent and have been able to open doors and other devices. In Boulder a local rumor was circulating that a few smart bears were discovering how to open bear-resistant trash cans, by either prying the top lid back, or learning how to slam the bear-resistant cans onto their side to push a metal pin in and pop the can open. If their meticulous tricks don't work and the food scent continues to entice the hungry bear, it may choose to use its powerful limbs to rip

through a garage door or break a window open. Home break-ins tend to be more common in the mountain communities west of Boulder, where vacation rentals commonly sit vacant for longer periods of time. According to CPW's unpublished conflict reports, one instance shows a bear breaking into an unlocked house and consuming the entire contents of the kitchen refrigerator, freezer, and garbage. Another bear tore a hole into a person's shed in an attempt to consume the garbage that was stored inside. After smelling some dog food inside one resident's attached garage, a bear somehow made its way through a doggy door to consume roughly 30 lbs. of kibble. The conflict reports continue on and on throughout the years, detailing just how determined these omnivores can be when it comes to finding food.

Before the Bear Protection Ordinance was implemented, public health and sanitation was another concern, specifically in Boulder's alleyways where waste bins are frequently stored. Boulder Bear Coalition's Brenda Lee would frequently walk the more problematic alleyways on trash day to document the extent of the bear-trash issue. In addition to countless waste bins knocked over and garbage spread throughout the alleys, she recalls the presence of rats being an issue in some of the more extreme instances. The bears would expose the contents of the waste bins, which would invite in other scavenging species such as Norway rats and raccoons. For some reason, though, this concern of public health and sanitation never gained much traction with residents. Valerie Matheson recalls one city council member commenting in 2014 after the Bear Protection Ordinance passed, that "only in Boulder would it take bears to solve a 10-year trash problem." Matheson laughed while saying she felt this was quite profound because for 10 years or so, there was trash strewn all over these alleyways, bringing on numerous aesthetic and sanitation related problems. This did not seem to be enough to turn the needle past the action point, and she has no explanation for that since

sanitation concerns were not a part of her role. Regardless, the Bear Protection Ordinance has had a tremendous impact in terms of cleaning up Boulder's alleyways.

TAKING ACTION

As demonstrated through the survey results and previous policies and actions taken, Boulder takes great pride in its abundance of local wildlife and wildlands. The desire to keep Boulder wild allows the city and its community to implement a variety of unique solutions that help residents peacefully coexist with large carnivores such as black bears. Without the community's support, Boulder would not be able to safeguard this species while also improving human safety and wellbeing. The examples below are just a handful of the standout measures being taken by the city, state, and its residents to live alongside black bears and will be available in further detail on my website.

The Bear Protection Ordinance was one of the major game changers in regard to reducing food attractants for bears and reducing negative conflicts. In March 2014, the ordinance was implemented by the City of Boulder and requires all trash and curbside compost to be secured from bears at all times until collected by a waste hauler in the western part of the city, an area that sits at the base of the foothills. Ordinance requirements that pertain to all properties west of Broadway and south of Sumac include: all compost and trash carts, containers, dumpsters, or enclosures must be bear-resistant OR stored in a building, house, garage, shed or other enclosed structure until emptied by a trash hauler. Residents that violate the BPO requirements risk steep fines without any warnings. The ordinance was implemented in various phasing and violation levels; currently fines begin at \$100 for the first offense, \$250 for the second, and \$500 for the third. Residents with broken bins have 72 hours to get their bins replaced by their waste hauler, or they risk being fined ("Co-existing With Bears").

Currently, city council is exploring expanding the ordinance to areas east of Broadway, as bear activity persists. This effort will be revisited in fall 2018.

To address the issue of wasted fruit and attracting wildlife to Boulder's urban areas, members of Falling Fruit, Boulder Food Rescue, 350 Colorado, The Shed, and Boulder Bear Coalition came together to form the Community Fruit Rescue (CFR). This coalition quickly put together a system for registering fruit trees on an online map, scheduling harvests, and then had Boulder Food Rescue deliver the fruit to homeless shelters, food banks, etc. Now, residents that request assistance with harvesting their fruit trees can register the trees with CFR and schedule harvests, where volunteers will show up to assist. Since its inception in 2014, Community Fruit Rescue has harvested over 20,000 lbs of fruit. About 95% of the fruit harvested by CFR is apples, simply because that is what's most available in Boulder. Once the fruit is harvested, it gets divided three different ways. The owner keeps a third, the volunteer pickers get to keep a third and divide it among themselves, and the last third comes back to CFR's bear-resistant storage space to be picked up by Boulder Food Rescue volunteers, who then deliver it to homeless shelters and food banks. Community Fruit Rescue is in high demand during peak harvest months, which provides an excellent volunteer opportunity for individuals looking to get involved.

The Bearsitter volunteer program was established in 2002 by Open Space and Mountain Parks (OSMP) interpreter Lynne Sullivan as a way to give urban black bears a better chance at survival while freeing up the time of OSMP rangers and CPW officers. In addition to being literal bear babysitters, a major role of a bear sitter volunteer is to educate citizens about how to be safe with bears, and how to manage their homes and property to discourage bears from lingering in neighborhoods. When called for, volunteers may walk a neighborhood contacting the nearby residents to alert people to the presence of bear(s), and also serve as

the eyes and ears for rangers and officers. Team members are trained by OSMP and CPW staff in bear natural history and behavior, and coached in crowd management and communication, to have the appropriate tools and judgement to be responsive to the safety needs of each situation. Bearsitters arrive to the scene only after an OSMP ranger or CPW officer have deemed the area safe, meaning the bear is not acting aggressively and is likely up in a tree sleeping. The goal is to keep the bear in the tree until the sun goes down. During the day, there are far too many active threats for both the bears and people, so bearsitters want to keep the bear in a safe, contained location. If the bear tries to come down too early, volunteers will haze (wave arms, yell, make loud noises) the bear back up the tree. Once the sun is down, volunteers, officers, and rangers will strategically position themselves and encourage the bear through hazing techniques to go in the desired direction. The hope is that the bear will return to the mountains and remember this unpleasant interaction with humans, never wanting to return to town.

In addition to some of these long-term programs and policies, one of the most important ways reduce conflicts is through continuous education, outreach, and by providing volunteer opportunities. Considering Boulder has a high rate of new residents and students arriving to the area each year, staying on top of outreach is a continuous process. Many people are not familiar with animals like black bears, and I've witness firsthand the variety of emotions that come in play with a person encounters a black bear. Oftentimes people are excited, but there's also a great deal of fear, ignorance, and sometimes frustration. Between Colorado Parks and Wildlife, Boulder Bear Coalition, and the City of Boulder, these groups are exploring new ways to educate and engage residents year after year.

CONCLUSION

There is no “one size fits all” in regard to achieving peaceful human-bear coexistence. The proper steps must be taken to understand the community’s values and experiences in order for successful ordinances to be designed, enacted, and enforced, and for meaningful outreach and education efforts to be deployed to residents. Conflicts with black bears will continue to increase throughout the years and instead of relying on Colorado Parks and Wildlife to carry the burden of having to relocate or kill nuisance bears, citizens of Boulder should instead be equipped with the knowledge and tools that will help them prevent future conflicts. If the community does not take an active role to secure attractants, bears will continue to be euthanized and public safety may become a stronger concern. Boulder, Colorado is a clear leader in the realm of wildlife coexistence, but there is still much work to be done. What’s needed is continued collaboration between city, county, state, and ongoing engagement with the local community.

I began this project thinking I would focus only on the community efforts taking place through Boulder Bear Coalition, and though these efforts are essential, I learned that I needed to take a much wider approach to incorporate the city and state. My hope is that this ongoing project will support the efforts of the City of Boulder, Colorado Parks and Wildlife, and the Boulder Bear Coalition so they may continue their respective efforts to reduce conflicts with black bears. With that in mind, this project will be ongoing, and I will continue to add in new stories and data as it becomes available. Looking back, if I was to change anything, it would have been to incorporate the work of the City and CPW sooner. The support and action coming from Boulder’s community can indeed help curb the number of negative interactions with black bears. However, without the coordinated efforts also coming from governing bodies, the community may not know how to assist. It’s a complex story that requires a great deal of explanation.

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