



MASTER PLAN

September 2019



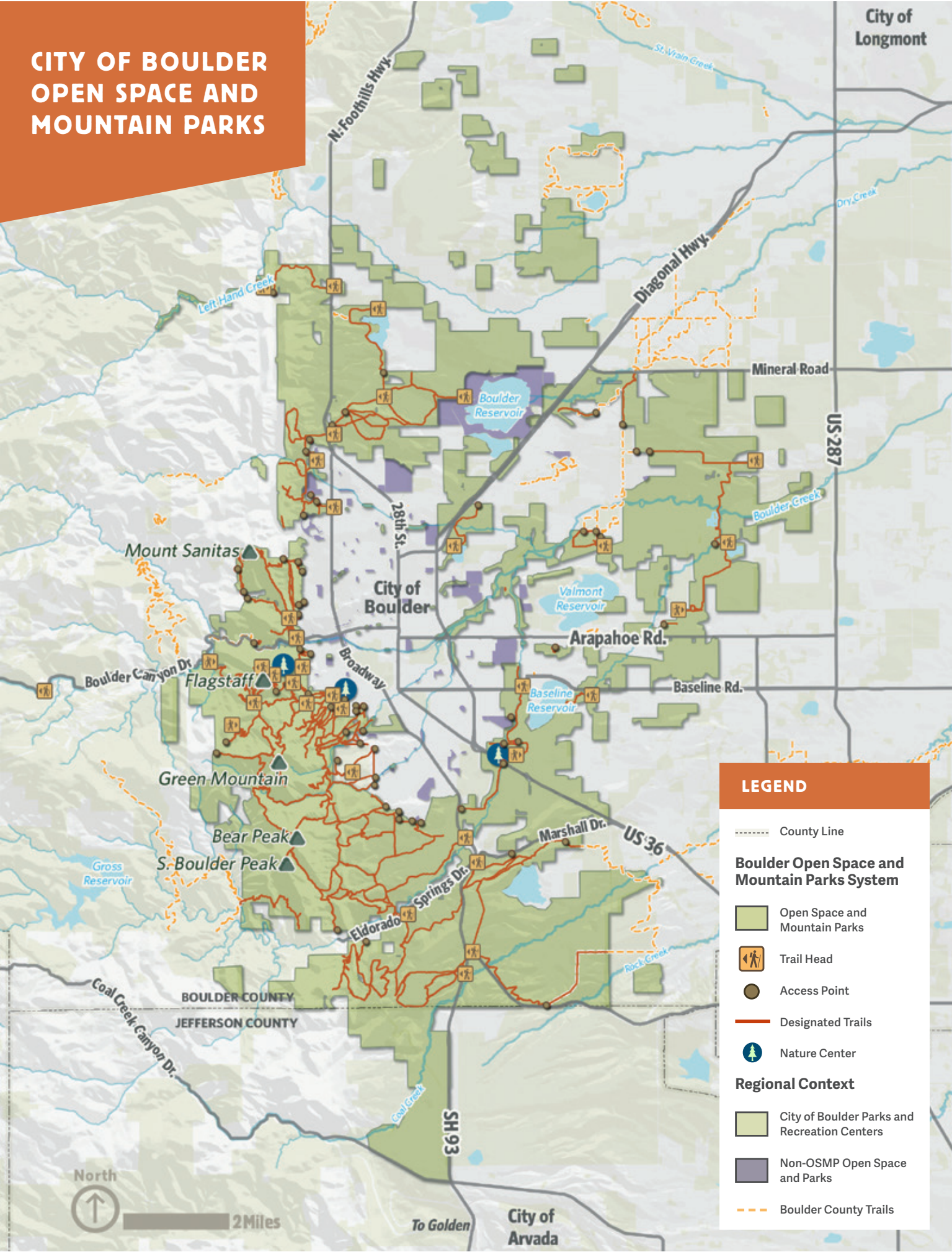
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CITY OF BOULDER
OPEN SPACE AND
MOUNTAIN PARKS



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From the Process Committee

Our community takes great pride in our extraordinary Open Space and Mountain Parks program. It is critical that our unique asset be managed in a way that reflects the diversity of voices across our entire community. Toward that end, a Process Committee was created to develop a plan and oversee the process for engaging with, and learning from, the community at each step that led to the creation of this Master Plan.

We, the undersigned, as the Process Committee for the OSMP Master Plan were honored to work with staff and our community to ensure that our collective hopes and dreams would be reflected in the final document. We would like to express our gratitude and appreciation to the thousands of people whose work and input were vital in truly making this Master Plan a community document.

Since our first meeting in August 2017, we worked closely with an outstanding staff team that included the Open Space and Mountain Parks Department, the city's Communication Department, and several outside consultants. Together, this team created a multi-faceted process that included seven community events, two drop-in listening sessions, a statistically valid community survey, online submissions and responses to questions, two study sessions with City Council, and more than a dozen meetings and study sessions of the Open Space Board of Trustees. We are particularly pleased that it also included targeted outreach to, and effective engagement with, over 1,400 people whose voices might not otherwise have been heard, including



members of the Latinx community, youth, and persons experiencing disabilities. Collectively, the team's engagement process generated more than 10,000 comments.

We as a community are passionate about our Open Space. This Master Plan is a great document not in spite of but because of the diverse perspectives and experiences that were brought to the table throughout this master planning process. Going forward, it is our hope that this document guides us in managing our lands in a manner that reflects our hopes and dreams and honors the integrity of this process.

Tom Isaacson
Curt Brown

Above: Process Committee members: Tom Isaacson, Aaron Brockett, Mary Young, Curt Brown. (Photo by Phillip Yates)

Acknowledgements

We would like to give our sincere appreciation and thanks to the many community members, Indigenous Peoples, volunteers, numerous partner agencies, the Master Plan Process Committee, Open Space Board of Trustees, and City Council who enjoy, value, and help protect Boulder’s Open Space and Mountain Parks system and who contributed their time and efforts in the development and completion of the Master Plan.

Genuine thanks also go to the following individuals for their contributions to this plan:

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Jane Brautigam, *City Manager*

Boulder City Council

- Suzanne Jones, *Mayor*
- Sam Weaver, *Mayor Pro Tem*
- Aaron Brockett (*Process Committee Member*)
- Cindy Carlisle
- Lisa Morzel
- Mirabai Kuk Nagle
- Bob Yates
- Mary Young (*Process Committee Member*)

Open Space Board of Trustees

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- Kevin Bracy-Knight (*served 2014-2019*)
- Curt Brown (*Process Committee Member*)
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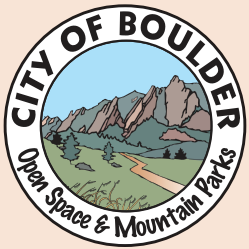
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CITY OF BOULDER OPEN SPACE & MOUNTAIN PARKS

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We are pleased to share with you the Open Space and Mountain Parks (OSMP) Master Plan!

The Boulder community values and has united in the preservation, stewardship, and enjoyment of the remarkable landscapes that surround and define the city for more than 120 years. Prior to city establishment, indigenous peoples held deep and long-standing connections and relationships with these lands that continue to this day that also need to be honored, acknowledged and appreciated. It is in the noble effort of protecting and caring for the land where we as people find common ground and a shared sense of purpose. The results of this effort are impressive as more than 46,000 acres of ecologically rich landscapes and awe-inspiring beauty have been protected and made part of the City of Boulder’s Open Space and Mountain Parks system.

However, our work together as a community is far from done as many difficult challenges and exciting opportunities await. That is why the OSMP Master Plan is such a significant document as it will serve to guide the stewardship of Boulder’s open space system over the next decade and beyond.

The Master Plan is a reflection of what our community values in our open space lands and incorporates input from thousands of people from diverse backgrounds and interests as well as meaningful contributions from OSMP staff, the Open Space Board of Trustees, Planning Board and City Council. The plan describes five areas of focus, outcomes we hope to realize over the next decade, and a set of prioritized strategies for OSMP to implement.

OSMP is excited to work in partnership to fulfill the vision expressed in the Master Plan. Together, we will strive to pass down to generations to follow an open space system that is vibrant, resilient, diverse, inclusive and that continues to inspire and unite our community. Thank you for your enduring interest and involvement as we continue working to extend the legacy of your public lands!

Sincerely,

Daniel E. Burke

Dan Burke
Director
Open Space and Mountain Parks

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Left: Photo by Jack Sasson

HOW TO USE THIS DOCUMENT

*“Be practical as well as generous in your ideals.
Keep your eyes on the stars, but remember to keep your feet on the ground.”*

—Theodore Roosevelt

Boulder residents are lucky – for living side by side with such a beautiful landscape and for having had the foresight to protect it. As staff for the City of Boulder’s Open Space and Mountain Parks (OSMP) department, we are equally lucky to steward this remarkable system of natural and agricultural lands for the public.

We all take this shared responsibility to heart, and it is through this Master Plan process, described more in Appendix A, that we talked about our collective future with creativity and optimism. We have learned from each other about what we all value and how to honor those values. We have built on past plans to design a unified future that is achievable within our means.

A product of meaningful consultation with community members, the Open Space Board of Trustees (OSBT), City Council and OSMP staff, the Master Plan focuses our energy, funding and expertise on a clear vision for the next decade and beyond. It describes our five focus areas – or central management themes – and the related open space values we all share. It articulates our aspirations and our collective hopes as desired outcomes for the future of OSMP – with broad management strategies to achieve them as well as examples of actions that will fulfill Master Plan guidance.

The 2019 OSMP Master Plan also sets manageable expectations about what can be achieved given our uncertain financial future. It prioritizes strategies into three tiers to describe the relative importance of strategies and the general timing with which they would be accelerated or emphasized during implementation. It clearly identifies a set of Tier 1 strategies that we will focus on first, while scaling all other work to align with available funding. Within each tier, the numbering of strategies does not indicate the relative order of importance.

Document Organization

Section 1 of the Master Plan lays out the basis for planning. Building on the 2018 System Overview Report, it includes a summary of key data and trends that have influenced the development of Master Plan outcomes, strategies and priorities. It also introduces existing citywide and OSMP guidance and the ways in which the Master Plan aligns with and advances those goals.

Section 2 is the heart of the Master Plan. For each of our five focus areas, it describes broadly shared aspirations about the future of Boulder’s OSMP system and the strategies for achieving them together with our community. The five focus areas are:

- » **Ecosystem Health and Resilience;**
- » **Agriculture Today and Tomorrow;**
- » **Responsible Recreation, Stewardship and Enjoyment;**
- » **Community Connection, Education and Inclusion; and**
- » **Financial Sustainability.**

This section also integrates important data, trends and background information – much of which is also described in the [System Overview Report](#) or in [supplemental materials](#) developed to support community engagement in the fall of 2018. This section also introduces the prioritization of strategies, with more information following in Sections 3 and 4.

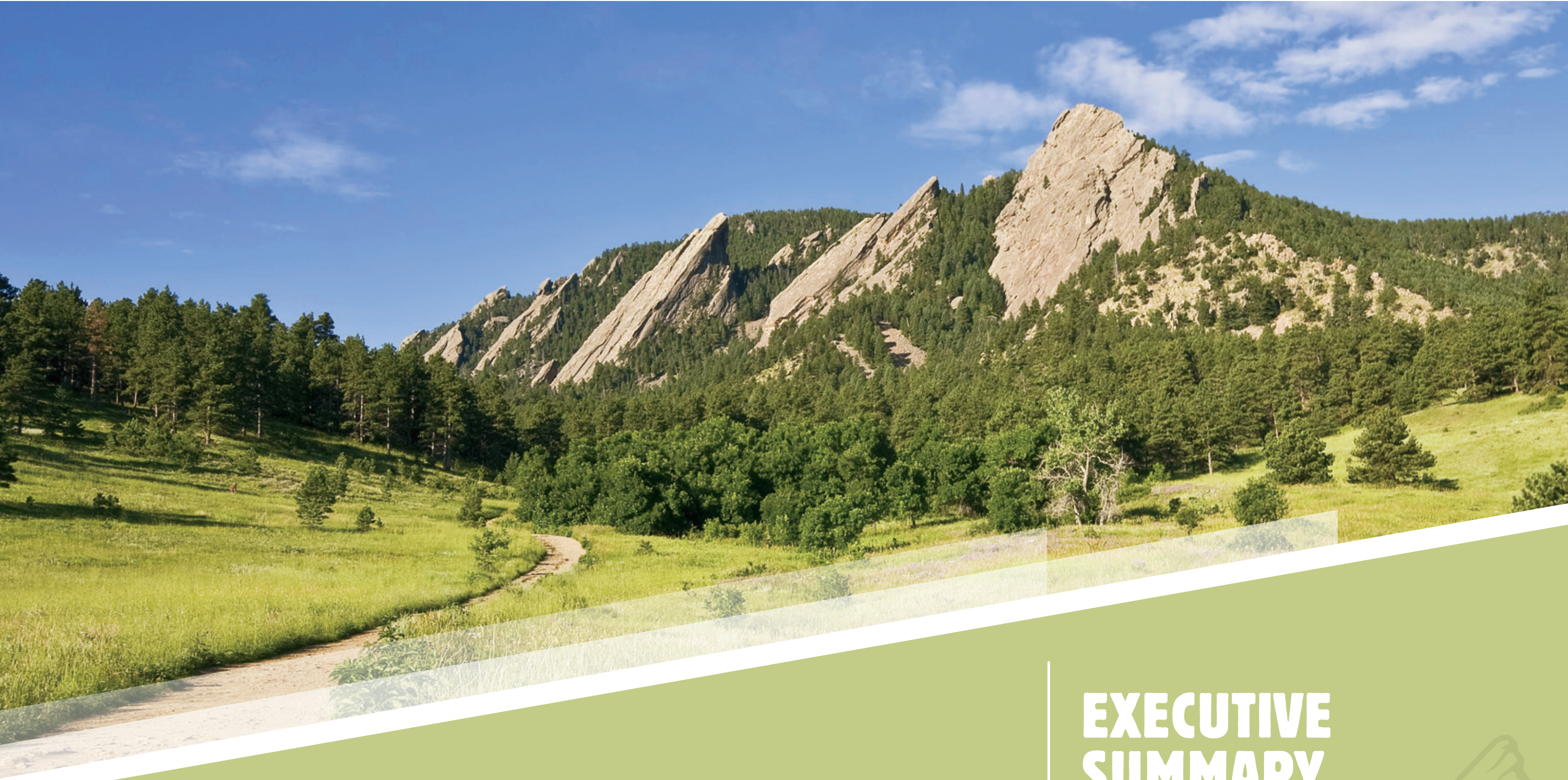
Section 3 explores funding needs to fulfill the Master Plan vision for the next decade. It pulls together a summary of how strategies have been prioritized, as well as estimates of our funding needs for each over 10 years. To design both an optimistic and responsible future, this section also anticipates three potential funding levels available to support implementation. It guides an integrated funding approach for the future, regardless of available funding, that responds to community priorities. This section and the Master Plan as a whole support future decision-making as OSBT, Planning Board and City Council members review and approve annual budgets.

Section 4 introduces our next steps after Master Plan adoption. It illustrates how our work-planning and budget processes will ultimately support efficient and effective implementation. It sets us out on a practical path towards our integrated vision for OSMP, in which we all work together – staff, residents, visitors and partners – to care for and enjoy our open space lands.

Definitions

The following definitions will help readers better understand and connect with the text in each section of the Master Plan.

MASTER PLAN COMPONENT	DEFINITION
Open Space Purposes in the City Charter	Approved by city voters in 1986, these serve as the fundamental guidance for managing open space lands.
Master Plan Focus Areas	These management themes describe what staff and the community should focus on for the next 10 years, with an eye to the next 50 years. They were derived from public and staff input, and unanimously adopted by City Council in July 2018.
Value Statements	Developed through broad community and staff engagement, these reflect what we find important about OSMP. Corresponding to each focus area, they help us understand each management theme, and motivate us to consider the open space values we all have in common.
Outcomes	These aspirational goals for OSMP describe the overall desired outcomes for each focus area. These were drafted with staff and public input and refined with guidance from the Open Space Board of Trustees.
Strategies	These describe management approaches for achieving desired outcomes. These were drafted with staff and public input and refined with guidance from the Open Space Board of Trustees and City Council.
Implementation Priorities	With input from the public, OSBT and City Council, ten strategies have been prioritized as Tier 1 – or most important to emphasize, especially in the first years of Master Plan implementation. Further explanation of implementation priorities is provided in Section 4 of the Master Plan.



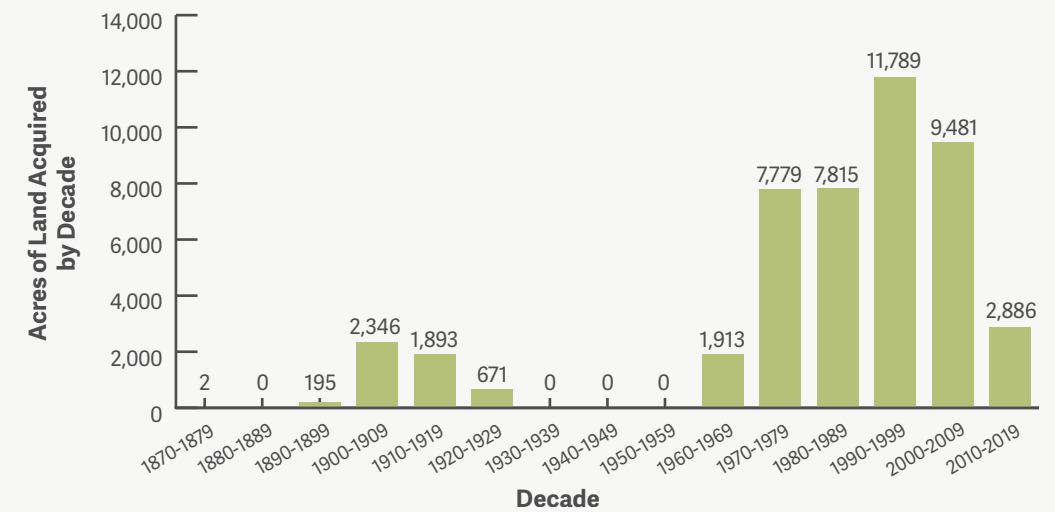
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EXECUTIVE SUMMARY



Left: Photo by Ann G. Duncan

Figure 0.1: Open Space Acquisitions Over Time by Decade



These legacy initiatives – of community-driven conservation and stewardship – have helped the City of Boulder preserve ecologically rich and iconic landscapes that are highly valued by residents and visitors alike. As described in our 2018 [System Overview Report](#), the city’s Open Space and Mountain Parks (OSMP) department now manages over 46,000 acres of public land – almost three times as much land as the city itself.

From dramatic cliffs in the mountain parks to the plains where rare tallgrass prairies, creeks, wetlands, farms and ranches intermingle, OSMP lands are diverse, dramatic and awe-inspiring. They provide habitat for 741 native plant species, 303 native bird species, 138 native butterfly species, 61 native mammal species, 21 native reptile and amphibian species and 18 native fish species. These lands also host some of the highest-quality cliff-nesting raptor habitats in the western United States.

EXECUTIVE SUMMARY

Over 120 years ago, the City of Boulder’s open space program began with the purchase of Chautauqua in 1898. Soon thereafter, Frederick Law Olmsted, Jr. – a renowned landscape architect and advocate for nature preservation – called on the community to preserve the mountain backdrop and areas along major waterways. In 1967, Boulder also became the first city in the United States to implement a tax to purchase and care for its natural lands – increasing our capacity to protect the land around Boulder through acquisitions (**Figure 0.1**).

Over the decades, professional staff working hand in hand with community volunteers have demonstrated the kind of persistent, diligent work it takes to keep our healthy lands resilient. Regional partnerships with adjacent landowners, vegetation management, educational and volunteer programs, and an adaptive management approach have all helped keep important habitat areas in good condition. Deteriorated areas have also come back to life, like once-plowed grasslands where prairie grasses and songbirds now thrive. Forests have been sustainably managed to help nature thrive and reduce fire risk to nearby homes.

In a unique partnership, one-third of OSMP lands – or about 15,000 acres – are leased to ranchers and farmers, who save OSMP more than \$1 million in labor and material costs annually. These ranchers and farmers also preserve Boulder’s agricultural legacy, creating stunning views of working landscapes against the mountain backdrop. Focused on producing food, feed and fiber, OSMP’s agricultural program also conducts research and integrated restoration projects to maintain healthy soils and habitat, encourage integrated, non-chemical pest management, promote water conservation and increase resilience to environmental change.

Residents’ long-term investment in natural landscapes also pays dividends today in the form of physical, mental and even spiritual wellness. *National Geographic* recently recognized Boulder as the “happiest city in the United States” for the benefits nature affords residents, and *Backpacker Magazine* called it “the best place to raise an outdoor kid.” Our extensive network of trails, facilities and education programs allows youth, families and people of all ages and abilities to explore nature. Our efforts help forge connections that inspire a life-long love of the land, inspiring current and future generations to understand, value and protect open space lands.

For thousands of years, generations of American Indian Tribes lived in and traversed the Boulder Valley – enriching countless oral and tribal traditions that shaped a special connection to the land. However, with Euro-American settlement in the Boulder area, that special connection was severed as treaties were broken and tribes were forcibly removed. For thousands of indigenous peoples who live in reservations outside of Colorado, and for those who live in Boulder today, histories and traditions passed down over the generations still connect them with Boulder’s special lands. With this Master Plan, Open Space and Mountain Parks seeks to not only preserve and protect these lands for future generations but to also acknowledge the past and collaborate with federally recognized American Indian Tribes and indigenous peoples to understand and honor their history, culture and long-standing relationships with the Boulder landscape.

For more information, see Section 2.4 or [Chapter 10 of the System Overview Report](#).

Top: Photo by
Frank Beck

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Photo by
Ann G. Duncan

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Photo by
Phillip Yates





Our Shared Values and Focus Areas

Boulder's system of Open Space and Mountain Parks is a powerful and enduring reflection of Boulder's values. The Boulder community has spent decades protecting natural lands, and in 1986, voters approved an amendment to the City Charter to define open space purposes and guide management. The City Charter states that open space shall be acquired, maintained, preserved, retained, and used only for the following purposes:

- a) natural areas with features or species of special value;
- b) water, landscapes and ecosystems;
- c) passive recreation;
- d) agriculture;
- e) limiting sprawl;
- f) urban shaping;
- g) floodplain protection; and
- h) aesthetics and quality of life.

Through the OSMP Master Plan process, community members confirmed the lasting value of these charter purposes, demonstrating that preservation and protection of the natural environment is an enduring, core community value. As detailed in Appendix A, in total:

- » Members of the public submitted more than 10,000 comments;
- » OSMP staff hosted seven community events and two drop-in listening sessions with a combined total of more than 900 attendees;
- » Staff engaged over 1,400 people who are not typically heard from during OSMP engagement processes, including members of the Latinx community, people experiencing disabilities and youth; and
- » More than 1,300 individuals completed and returned a mailed statistically valid survey in spring 2019.

Through this collaborative process, a set of open space values we all share was developed and affirmed, with a corresponding focus area or management theme to guide staff over the next decade and beyond. The five focus areas below can be understood through those value statements, which merged these community voices with those of OSMP staff, the Open Space Board of Trustees (OSBT) and City Council. These values inspire us to work together to ensure our landscapes remain healthy and enjoyed long into the future.

Top: Photo by Phillip Yates

Bottom: Photo by Dave Sutherland

OUR SHARED VALUES AND FOCUS AREAS

Ecosystem Health and Resilience

Using the best available science, we protect healthy ecosystems and mend those we have impaired.

Agriculture Today and Tomorrow

Our legacy and future are based on working landscapes that are in harmony with nature.

Responsible Recreation, Stewardship and Enjoyment

We are united by our connection to and enjoyment of nature and our obligation to protect it.

Community Connection, Education and Inclusion

Together, we build an inclusive community of stewards and seek to find our place in open space.

Financial Sustainability

We steward public funding to fulfill the City Charter purposes for open space.



ECOSYSTEM HEALTH AND RESILIENCE: HELPING NATURE THRIVE IN A CLIMATE CRISIS

Using the best available science, we protect healthy ecosystems and mend those we have impaired.

We support and preserve healthy ecosystems, without which Boulder would not be Boulder. According to the 2019 OSMP Master Plan Survey of Boulder Valley residents, 79 percent of respondents felt **Ecosystem Health and Resilience** is one of the most important themes to guide OSMP management in the future as can be seen in Appendix B. Generations of Boulder residents have long worked to preserve and protect important natural areas, modeling this core community value for children and

youth to emulate. This collective approach to stewardship has preserved and restored thousands of acres across the system.

Still today, our two major ecosystems – grasslands and forests – need our help now more than ever. Ecological monitoring tells us these ecosystems on OSMP lands are, on average, only in fair condition (see [Chapter 5 in the System Overview Report](#)). Non-native species and disturbances to riparian areas remain important management challenges to address. Ongoing monitoring to understand conditions over time will improve our understanding and result in updated policy, programs and projects to improve ecosystem health and increase resilience in the face of a global climate change crisis.

Above: Photo by Jeff Regier

Left: Photo by Phillip Yates

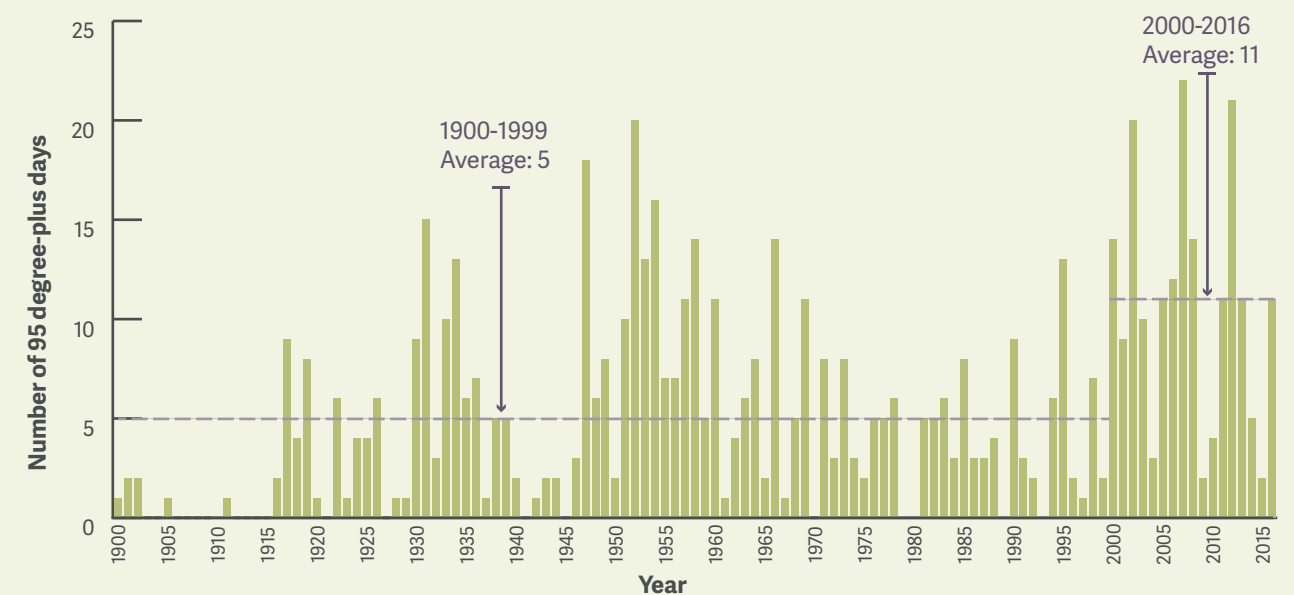
WHAT DOES THE GLOBAL CLIMATE CRISIS MEAN FOR US AND OUR OPEN SPACE LANDS?

The climate crisis is a serious global challenge that already has many local impacts. In Boulder today, it is significantly drier and hotter than it was 50 years ago (**Figure 0.3**), and an even drier future likely awaits (Boulder's Climate Commitment, 2017). This is important because Boulder lies in a semi-arid climate zone where water is already at a premium. Invasive, non-native plant species – which tend to out-compete native species in altered environments – are making it hard for native plants to survive, affecting the animals that depend on them, the waterways we all depend on, and the overall health of even our largest habitat blocks.

With these changes, we might expect:

- » increased spread of invasive species and pests;
- » loss of plant populations in hot microsites;
- » reduced habitat for wetland and aquatic species;
- » more frequent and extreme natural disasters;
- » significant damage to our natural environment from increased severity and frequency of floods and fires; and
- » higher costs associated with preventing and recovering from dramatic change.

Figure 0.3: Boulder's Extreme Weather History (Replotted with Rocky Mountain Climate and NCDC.NOAA.gov data)



Our agricultural legacy is also facing disruption to the way we have traditionally worked the land for the last century. While more carbon dioxide may lead to more crop yields, these gains will likely be offset by higher temperatures, lower water availability and increased winter survival of pests. The timing and availability of forage for cattle also will likely become less certain, making ranching operations more difficult. And with a portfolio of \$60-\$70 million* in water rights plus extensive infrastructure like ditches and farm buildings, a more arid future will compound maintenance and management issues for agriculture. (*OSMP is in the process of updating this figure to better understand the true value.)

Increased temperatures may also affect visitation patterns and visitor safety. More hot days may cause some visitors to come earlier or stay later, affecting transportation patterns and infrastructure needs. For example, we may see visitors gravitate to shady trails, affecting overall use patterns across the system. It may also compromise wellbeing as the risk of heat-related syndromes increases and the increased severity and frequency of floods and fires threatens human life and property.

WHAT CAN WE DO TO ADDRESS THE PROBLEM?

Conservation and restoration of our most important habitats – from the smallest areas that support rare orchids to the largest habitat blocks that support wildlife movement – will become even more critical in the face of rapid environmental change. OSMP staff are already working to increase the resilience of our natural systems through prescribed burns, forest thinning, and stream, riparian and floodplain restoration. For example, as of 2017, OSMP staff had improved forest ecosystems and reduced the risk of catastrophic wildfire by thinning trees in 1,500+ acres of overly dense forests (System Overview, 2018). We also acquire habitat and floodplains to prevent urban development, preserve ecosystem function, and support in-stream flows and natural floodplains. Through environmental education, staff is also preparing and engaging the next generation who will have to deal directly with the impacts of the climate crisis.

Right: Photo
by Heather
Sherman



More broadly, addressing the global climate crisis requires a holistic approach to understanding direct impacts to OSMP lands and the role they play in future solutions for the region and planet. Among a host of other integrated efforts, our work over the next decade will include:

- » controlling invasive species;
- » carbon farming to slow the effects of greenhouse gas emissions;
- » improving the resilience of trails and visitor infrastructure;
- » environmental literacy and volunteer programs that inspire climate action; and
- » continued acquisitions that enhance our ability to protect native plant and animal species.

Collaboration is vital to achieving effective conservation. At the heart of our future successes will be community stewardship and partnerships with the U.S. Fish and Wildlife Service, Colorado Parks and Wildlife, the Colorado Natural Heritage Program, neighboring land management agencies, community organizations and nonprofits. By setting our collective sights on a healthy future for nature, we ourselves will thrive. Master Plan guidance in the **Ecosystem Health and Resilience (EHR)** focus area will inspire that shared sense of stewardship and a commitment to preserve and restore ecological health in an uncertain future.

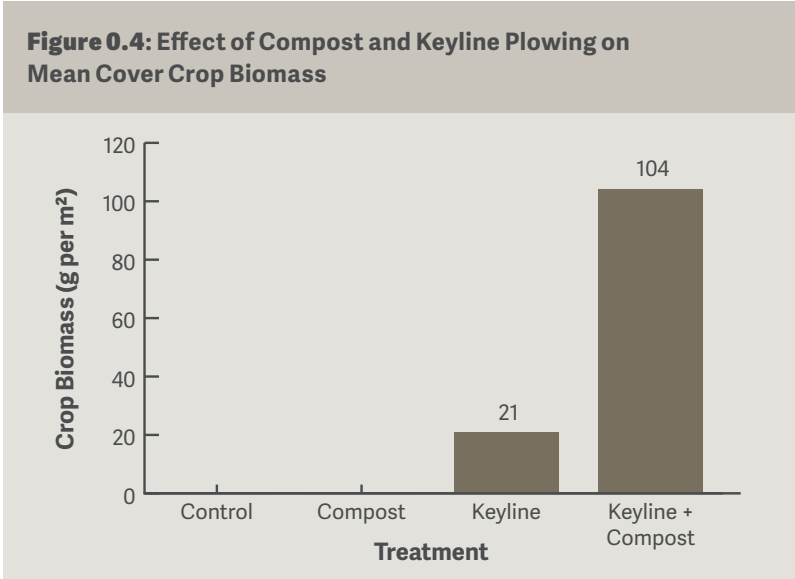
AGRICULTURE TODAY AND TOMORROW: ENSURING A RESILIENT FUTURE FOR AGRICULTURE

Our legacy and future are based on working landscapes that are in harmony with nature.

One-third of Boulder’s open space lands are leased to agricultural producers, resulting in strong partnerships and a shared land ethic (see [Chapter 7 in the System Overview Report](#)). We aim to preserve agricultural uses of the land that are both ecologically healthy and beneficial for agricultural production. However, many farmers and ranchers are aging, and they hold the institutional knowledge of how to manage OSMP’s agricultural lands. High costs, the lack of affordable housing, wind and soil erosion, as well as conflicts with prairie dog colonies, also impede the success of our farmers and ranchers.

While OSMP farmers currently grow diversified vegetables on 30 acres of land and an additional 250 acres are suitable for more, available labor and infrastructure costs also inhibit progress toward a more robust, local agricultural economy. With no local processing facility for beef, ranchers are challenged in expanding beef production. As described above, the climate crisis will exacerbate these conditions.

Some promise lies in early research and experimentation on soil regeneration and storing atmospheric carbon in degraded



agricultural soils. Initial results from piloting this practice – called carbon farming – highlight the importance of an integrated approach to responsible agricultural practices, land restoration, weed management and grassland health. For example, **Figure 0.4** demonstrates how compost application, when combined with keyline plowing (a subsoil plowing technique), could be used as management intervention to increase soil health in degraded agricultural fields, in turn sequestering more carbon in agricultural soils. Staff are also developing a soil health program using national best practices such as cover cropping and crop rotation to maintain soil health. Supportive monitoring efforts will track soil organic matter and soil health over time to help ensure the sustainability of agricultural land. Thus, by studying and encouraging regenerative practices on farms and ranches, OSMP is developing and integrating ways to respond to the climate crisis.

The full management approach described in the **Agriculture Today and Tomorrow (ATT)** focus area aligns with and builds on the recent [Agricultural Resources Management Plan](#). It also works closely with guidance in the **Ecosystem Health and Resilience** focus area and the [Grassland Ecosystem Management Plan](#).

Top Left:
Photo by Dave Sutherland

Top Right:
Photo by Phillip Yates

Bottom: Photo by Phillip Yates



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Bottom: Photo by Ann G. Duncan

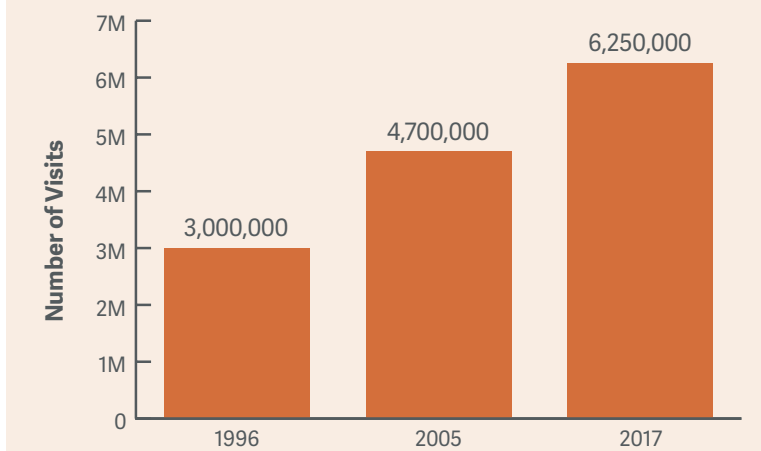
RESPONSIBLE RECREATION, STEWARDSHIP AND ENJOYMENT: INSPIRING QUALITY OF LIFE

We are united by our connection to and enjoyment of nature and our obligation to protect it.

As the Front Range population has grown over time, so has interest in outdoor recreation across Colorado. As described in [Chapter 2 of the System Overview Report](#), OSMP lands supported roughly 6.25 million visits in 2017, up 34 percent from 4.7 million in 2005 (**Figure 0.5**). Staff estimate that City of Boulder residents account for roughly 60 to 80 percent of all visits systemwide, but these numbers vary site by site. For example, trails in the northern part of the system are predominantly visited by residents, while places like Chautauqua tend to attract more visitors from outside the city, county and state (2016-2017 OSMP Visitation Study).

Rising visitation stresses a system originally designed to accommodate far fewer residents and visitors. Our history of professionally designed trails and visitor facilities on OSMP began in the 1930s with many of the iconic trails, shelters, roads, gathering areas and viewpoints in the Mountain Parks designed for the City of Boulder by the National Park Service (NPS). Today, these facilities define the physical and cultural identity of our open space

Figure 0.5: Increasing OSMP Visitation Over Time



system and our community. However, the city's population is 10 times what it was when they were originally designed, and their maintenance is often challenging and expensive. In addition, soils, drainage and muddy conditions throughout the system present trail design and maintenance challenges that compound issues associated with high levels of use.

Outcomes and strategies in the **Responsible Recreation, Stewardship and Enjoyment (RRSE)** focus area will focus staff work on the most important needs and opportunities to ensure visitors continue to enjoy themselves and develop a relationship with the land amid these changing conditions. Especially as demographics and desires shift over time, an inclusive approach to supporting high quality experiences for all ages, backgrounds and abilities will grow in importance. For more information, see [Chapter 8 of the System Overview Report](#).

An integrated implementation approach will also incorporate guidance from other focus areas, including **Ecosystem Health and Resilience**. For example, while maintenance needs throughout the system continue to expand, increased trail use on and off managed trail corridors has unintended impacts on certain wildlife and plants, facilitating the movement of weeds and pests and causing erosion, all of which reduce the system’s resilience in the face of climate change. OSMP staff are making efforts to update our design and construction practices and address facilities reaching the end of their life cycle. We are also exploring ways to adapt to more frequent and intense flooding, high levels of use, erosion and the proliferation of undesignated trails. In addition, strategies for inspiring community stewardship under **Community Connection, Education and Inclusion** will also inform how staff encourage responsible recreation and lasting connections with the land.

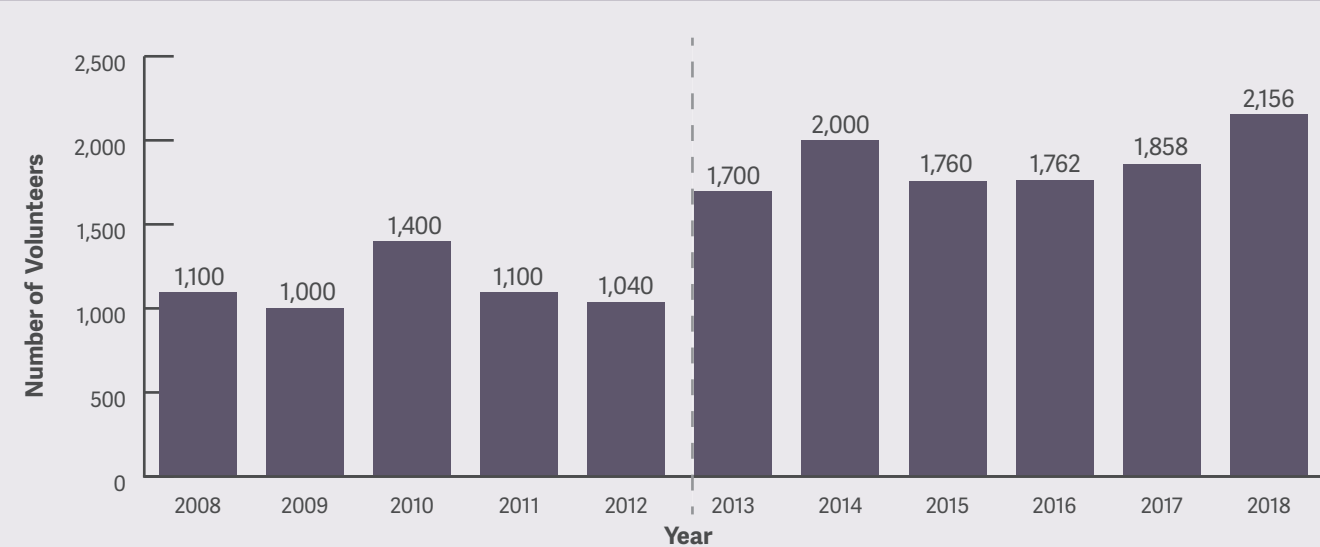
COMMUNITY CONNECTION, EDUCATION AND INCLUSION: BUILDING A COMMUNITY OF STEWARDS

Together, we build an inclusive community of stewards and seek to find our place in open space.

Like many communities along the Front Range, Boulder’s demographic profile is shifting, which will affect who visits and stewards open space in the future. For example, since 2000, the number of people of Hispanic origin has increased more than 8 percent in Boulder, while across the nation, the Hispanic population increased by 43 percent (City of Boulder, 2017). Moreover, according to 2018 U.S. Census data, more than 4,700 Boulder residents under the age of 65 experience a disability. National trends suggest young people are also spending less and less time outdoors.

Work needs to be done to understand what these data mean for engagement with OSMP lands. For example, while the benefits of time outdoors include cognitive development, higher academic performance, and improved physical and mental health (Klepeis, 2001), Boulder residents report lack of time as the most common reason they do not visit OSMP more often. Not feeling welcome or safe is another barrier for some (2019 OSMP Master Plan Survey).

Figure 0.6: Increased Volunteering Over Time. Vertical Line Represents the Increased Volunteer Effort after the Flood of 2013.



In addition, the future of Boulder’s human and natural communities is inextricably linked to the emerging climate crisis. Environmental education in the last 50 years has bespoke the importance of protecting nature. Inducing wonder and awe of nature in youth ultimately leads to understanding, appreciation and its protection. These major tenets of environmental literacy need to be retained, yet with the pending climate crisis, communities of all ages will need to take greater responsibility in the coming decade. Environmental education is a powerful way to teach and inspire positive environmental behaviors, including inspiring action that builds resilience (Ardoin, 2019). Therefore, it is more important than ever that environmental education include opportunities to work side by side with youth as we think about humanity’s response to the climate crisis, begin to take action, and possibly fix what recent generations including ourselves have created.

Over the years, staff has seen a growing interest and participation in volunteering as a form of recreation, in which community members enjoy taking care of their open space lands (**Figure 0.6**). In 2018, more than 2,100 volunteers provided nearly 19,000 hours of their time to help their public lands – contributing service valued at more than \$500,000.

Outcomes and strategies within the **Community Connection, Education and Inclusion (CCEI)** focus area build on our community’s love of open space and our past successes at engaging with them. Our collective future depends on deep connections with nature, agriculture, and the sense of community they both engender. We all benefit from a shared, long-term commitment to open space, especially as financial conditions may change in the future.

FINANCIAL SUSTAINABILITY: FUNDING AN UNCERTAIN FUTURE

We steward public funding to fulfill the City Charter purposes for open space.

For five years, we have prepared for an annual \$10 million budget reduction starting in 2020. We paid down outstanding obligations for past acquisitions, maintained reserve funds and found efficiencies by improving internal processes. We reduced capital investments and ongoing operating spending and expired vacant positions where appropriate. Looking forward, further reductions in overall spending will be necessary without additional revenues.

As stewards of public funding, we seek to build trust and lasting value for the community. To that end, the Master Plan further advances our readiness for a range of potential futures. At any funding level, we will spend our time and money in ways that advance our shared values, focus areas, outcomes and strategies to fulfill the Master Plan vision.

We also recognize that reduced funding will mean difficult decisions. With fewer dollars to spread across all OSMP services, even high priority Master Plan strategies may not be fully funded. As capital spending and staffing levels decline, so too does our ability to undertake significant ecosystem projects or make progress against ongoing trail maintenance needs. Therefore, conditions in parts of the overall system may deteriorate over time despite our best attempts to maintain what we currently have.

The Master Plan lays out a realistic, responsible and optimistic approach to funding and implementing the Master Plan vision for the next decade by:

- » Defining the comparative importance of each focus area to align funding with community values;
- » Describing three potential funding levels that may be available to support implementation of the Master Plan vision;
- » Laying out the comparative importance of strategies to clarify expectations and inform achievable work plans for staff that align with community priorities; and
- » Describing how we will get to work on action planning for implementation of the Master Plan.

Acknowledging our current conditions and future challenges for maintaining fiscal health, the above approach sets up a creative, efficient approach to **Financial Sustainability (FS)**.

Right: OSMP image

Overview of Outcomes and Strategies

As an integrated whole, the Master Plan describes our vision for the next decade. Specifically, outcomes are aspirational goals for OSMP that describe the overall desired future conditions for each focus area. Strategies describe management approaches for achieving desired outcomes. Both outcomes and strategies were developed with staff and public input and refined with guidance from the Open Space Board of Trustees and City Council. The following pages provide an overview of the outcomes and strategies, as well as how strategies have been prioritized to guide staff work plans in alignment with community priorities.



FOCUS AREA

Ecosystem Health and Resilience (EHR)

Value statement: Using the best available science, we protect healthy ecosystems and mend those we have impaired.

EHR OUTCOMES

EHR.A) HIGH DIVERSITY OF NATIVE PLANTS AND ANIMALS

OSMP lands support a high diversity of native plants and animals, expansive natural areas and some of the most critical wildlife habitat along the Front Range.

EHR.B) RESTORED, RESILIENT HABITAT

Degraded habitat with high potential to support native or extirpated (i.e., locally extinct) native species is restored and made more resilient to stressors like invasive species or direct and indirect human impacts.

EHR.C) CLIMATE ACTION

OSMP is a leader in helping native ecosystems withstand and adapt to the effects of the climate crisis.

EHR.D) INFORMED, SHARED STEWARDSHIP

OSMP and the community work side by side to develop a greater understanding of the land and to safeguard our natural heritage.

EHR STRATEGIES

① EHR.1) PRESERVE AND RESTORE IMPORTANT HABITAT BLOCKS AND CORRIDORS

Sustain, enhance, connect and restore habitat blocks with high ecological value and potential through conservation practices.

① EHR.2) UPDATE AND CONTINUE IMPLEMENTING SYSTEM PLANS
GUIDING ECOSYSTEM MANAGEMENT

Update the Grassland and Forest Ecosystem Management Plans and continue managing entire ecosystems by considering all elements and processes of natural systems rather than focusing on one species or attribute at a time.

① EHR.3) ADDRESS THE GLOBAL CLIMATE CRISIS HERE AND NOW

For the benefit of natural ecosystems and future generations, exhibit environmental leadership by taking immediate, targeted and unified action in response to ecosystem changes that the global climate crisis will bring about.

EHR STRATEGIES (Continued)

② EHR.4) REDUCE UNDESIGNATED TRAILS

Guided by best practices or area-specific plans, mitigate resource impacts by restoring, designating, re-routing or recategorizing undesignated trails, especially in sensitive habitat areas, while considering appropriate routes to serve desired destinations for visitors.

② EHR.5) EXTEND ON-TRAIL REQUIREMENTS

Through future area planning, reduce off-trail travel in targeted locations, especially in sensitive habitat areas.

② EHR.6) CONTROL INVASIVE SPECIES

Prioritize management and control of species that have severe and/or widespread impacts, particularly those that are non-native and most likely to be controlled.

③ EHR.7) DEVELOP A LEARNING LABORATORY APPROACH TO CONSERVATION

Conduct, support, apply and widely distribute the findings of longterm scientific research to inspire and engage community stewardship.

③ EHR.8) REDUCE IMPACTS FROM NOISE, LIGHT AND NEARBY LAND USES

Mitigate impacts to wildlife, sensitive habitat areas, scenic character or natural soundscapes from noise pollution, light pollution and adjacent land uses.

③ EHR.9) REDUCE AND OFFSET OSMP GREENHOUSE GAS EMISSIONS

Support the citywide climate commitment by reducing and offsetting greenhouse gas emissions related to departmental operations.

KEY	(See Sections 3 and 4 for details on Priorities and Implementation)
①	Tier 1 Strategy: Most important, will be accelerated and emphasized with more staff time and funding, especially in the first few years of Master Plan implementation
②	Tier 2 Strategy: Next most important, will receive incremental funding and effort as capacity allows
③	Tier 3 Strategy: Third most important, will receive incremental funding and effort as capacity allows

FOCUS AREA

Agriculture Today and Tomorrow (ATT)

Value statement: Our legacy and future are based on working landscapes that are in harmony with nature.

ATT OUTCOMES

ATT.A) VIABLE AGRICULTURAL LIVELIHOODS

The city’s ranchers and farmers are valued and supported in their contributions to the stewardship of Boulder’s agricultural heritage.

ATT.B) SUSTAINABLE, PRODUCTIVE AGRICULTURE

OSMP’s agricultural lands and infrastructure remain productive and sustainable long into the future.

ATT.C) DIVERSE AGRICULTURAL PRODUCTS FOR LOCAL MARKETS

A diversity of food and agricultural products is grown on suitable open space properties to better meet the changing demands of the local agricultural economy and the needs of ranchers, farmers and city residents.

ATT.D) HIGH-VALUE HABITAT ON RANCHES AND FARMS

City agricultural lands provide high-value habitat for rare and native species, integrating both agricultural and ecosystem objectives.

ATT.E) SOIL HEALTH AND RESILIENCE

Appropriate agricultural practices protect high-quality soils from erosion, improve productivity, maintain soil health and increase resilience in a changing climate.

ATT.F) RESILIENT AND EFFICIENT WATER SUPPLY

OSMP emerges as a leader in the acquisition and preservation of water assets and the application of innovative irrigation practices that anticipate environmental change.

ATT.G) APPRECIATION FOR WORKING LANDSCAPES

Community members experience and better understand working landscapes, contributing to the preservation of Boulder’s agricultural lands and heritage.

ATT STRATEGIES

① ATT.1) REDUCE MAINTENANCE BACKLOG FOR AGRICULTURE AND WATER INFRASTRUCTURE

Focus investments on maintaining and improving existing agricultural infrastructure to standards – both water-related and structural.

② ATT.2) INCREASE SOIL HEALTH AND RESILIENCE

Manage agricultural activities in tilled lands and native grasslands to prevent soil erosion, maintain and/or improve soil health, sequester carbon and protect ecosystem function.

② ATT.3) ADDRESS CONFLICTS BETWEEN AGRICULTURE AND PRAIRIE DOGS

Maintain the viability of agricultural operations by reducing impacts from prairie dogs on irrigated lands, while supporting ecologically sustainable prairie dog populations across the larger landscape.

② ATT.4) PROTECT WATER RESOURCES IN A WARMER FUTURE

Develop and implement a water resources management plan that balances sustainable agriculture, ecosystem stewardship, protection of water rights, efficiency of water use and resilience in a more variable climate.

③ ATT.5) ENCOURAGE DIVERSE AND INNOVATIVE AGRICULTURAL OPERATIONS

Partner with open space ranchers and farmers to analyze and where appropriate expand the variety of agricultural operations on OSMP lands, focusing on the infrastructure and technical assistance needed to support local food systems, including diversified vegetable farming, pastured livestock, micro dairies and taking products to market.

③ ATT.6) SUPPORT THE SUCCESS OF RANCHERS AND FARMERS

Where appropriate, evaluate and pilot cost-sharing, partnerships and other mechanisms to encourage both responsible land stewardship and economic viability for a diverse range of current and future farmers and ranchers on OSMP lands.

③ ATT.7) INTEGRATE NATIVE ECOSYSTEMS AND AGRICULTURE

While maintaining the viability of agricultural operations, evaluate and increase the potential for improving the quality of habitat on agricultural lands through staff-led programs and partnerships with ranchers and farmers.

③ ATT.8) FURTHER REDUCE OR ELIMINATE PESTICIDE USE

Reduce or eliminate the use of pesticides wherever possible. When reduction or elimination of pesticides is not possible, use the least toxic and least persistent pesticide that is effective.

③ ATT.9) ENHANCE ENJOYMENT AND PROTECTION OF WORKING LANDSCAPES

Partner with community members, farmers and ranchers to maintain and enhance the condition of working landscapes, viewsheds and historic structures.

FOCUS AREA

Responsible Recreation, Stewardship and Enjoyment (RRSE)

Value statement: We are united by our connection to and enjoyment of nature and our obligation to protect it.

RRSE OUTCOMES

RRSE.A) DIVERSE RANGE OF RECREATIONAL EXPERIENCES

A fun and diverse range of passive recreational experiences inspire stewardship and contribute to our physical and mental well-being.

RRSE.B) ENJOYABLE, RESPONSIBLE RECREATION

Amid changing visitor use levels and patterns, ecosystem health is sustained, and visitor experiences remain positive.

RRSE.C) WELCOMING, ACCESSIBLE TRAILHEADS

Welcoming trailheads and supporting recreational facilities provide access to and highlight Boulder’s scenic, natural and cultural landscape.

RRSE.D) GREAT EXPERIENCES FOR ALL

Visitors respect and care for each other and for the land, so all can enjoy themselves for generations to come.

RRSE.E) HIGH-QUALITY TRAIL NETWORK

Visitors can enjoy OSMP lands and reach a range of recreational destinations through a well-maintained, connected network of local and regional trails that is welcoming and accessible to all.

RRSE STRATEGIES

① RRSE.1) ASSESS AND MANAGE INCREASING VISITATION

Continue implementing measures from approved plans to mitigate impacts of increasing visitation in specific locations, while also updating the systemwide visitor use management plan to generate and implement ideas for understanding and addressing visitation growth throughout the system and to nurture stewardship and enjoyable visitor experiences.

① RRSE.2) REDUCE TRAIL MAINTENANCE BACKLOG

Using a prioritized, life-cycle approach to improving the condition of OSMP’s diverse portfolio of historic and modern trails, develop and implement a maintenance approach to fix immediate needs and identify what is needed to manage the trail network long-term.

RRSE STRATEGIES (Continued)

② RRSE.3) UPDATE GUIDELINES AND STANDARDS FOR QUALITY TRAIL DESIGN AND CONSTRUCTION

Design and construct quality trails that facilitate a range of experiences through a variety of landscape types, using design guidelines and construction standards that elevate the quality, sustainability and accessibility of trails and encourage the use of native materials that blend with natural surroundings.

② RRSE.4) ENCOURAGE MULTIMODAL ACCESS TO TRAILHEADS

Explore and partner on a range of coordinated transportation and design solutions to reduce parking congestion, reduce greenhouse gas emissions from visitor travel and promote active living, ecosystem health and public transportation.

② RRSE.5) MANAGE PASSIVE RECREATION ACTIVITIES REQUIRING AN OSMP PERMIT

Support enjoyable and compatible recreation experiences by periodically evaluating and refining management practices for use permits, off-leash dog visits and other related regulations to minimize resource impacts and ensure programs are easy-to-understand for visitors, manageable for staff and responsive to changing conditions.

③ RRSE.6) SUPPORT A RANGE OF PASSIVE RECREATION EXPERIENCES

Continue to honor a diverse range of passive recreation opportunities that respect the unique character and history of the Boulder community and its surrounding open space lands, providing fun and memorable experiences.

③ RRSE.7) BUILD NEW TRAILS AS GUIDED BY PAST AND FUTURE PLANS

Implement past and future plans by constructing new local and regional trail segments where lands offer high recreation potential, especially when opportunities for citywide and regional partnerships leverage OSMP funding.

③ RRSE.8) PROVIDE WELCOMING AND INSPIRING VISITOR FACILITIES AND SERVICES

For a range of visitor demographics, continue to provide and improve welcoming, sustainable and accessible trailheads and facilities that lay lightly on the land and inspire understanding of the surrounding landscape, such as the Ranger Cottage, Flagstaff Nature Center, Panorama Point, and other gathering areas or viewpoints.

③ RRSE.9) DEVELOP A LEARNING LABORATORY APPROACH TO RECREATION

Combine community engagement results with scientific research and comprehensive data analysis to understand trends, develop and assess practical initiatives, and design management approaches that seek to improve community well-being, enjoyment, understanding and stewardship.

FOCUS AREA

Community Connection, Education and Inclusion (CCEI)

Value statement: Together, we build an inclusive community of stewards and seek to find our place in open space.

CCEI OUTCOMES

CCEI.A) INSPIRING ENVIRONMENTAL EDUCATION

Visitors participate in education programs and other forums that deepen their sense of place and appreciation for Boulder’s natural, cultural and scenic heritage and broaden their understanding of OSMP land and its management.

CCEI.B) FULFILLING COMMUNITY INVOLVEMENT

Community volunteerism, partnerships and neighborhood involvement serve an increasingly vital role in OSMP’s fulfillment of the City Charter purposes for open space.

CCEI.C) LIFETIME CONNECTIONS WITH NATURE

Long-term connections with OSMP lands are strengthened and deepened over the course of our lives and across generations, in part to inspire response to the climate crisis.

CCEI.D) PHYSICAL AND MENTAL WELL-BEING

Increase awareness of the benefits of nature and the ways visiting OSMP lands can reduce stress and increase physical and mental well-being.

CCEI.E) ENGAGED YOUTH INSPIRED BY NATURE

OSMP is an emerging leader in promoting an increase in the time that youth spend outdoors and caring for their open space system.

CCEI.F) PROMOTING EQUITY AND INCLUSION

We are all part of an inclusive community, where all people feel welcome, safe and able to enjoy the benefits of open space.

CCEI.G) CONNECTIONS TO BOULDER’S PAST

Cultural landscapes and historic resources on OSMP lands are preserved so that people can enjoy and understand the places and stories of Boulder’s past.

CCEI STRATEGIES

① CCEI.1) WELCOME DIVERSE BACKGROUNDS AND ABILITIES

Improve understanding, services and facilities for underserved communities through outreach, collaborative partnerships, listening sessions, culturally-relevant programming, language translations, visual signs and materials, staffing and other creative means of empowering and engaging underserved members of our community.

CCEI STRATEGIES (Continued)

① CCEI.2) ENHANCE COMMUNICATION WITH VISITORS

Foster discovery, enjoyment and stewardship through a coordinated effort to enhance signs, communications and media that incorporate effective design, messaging and languages for a range of audiences as well as increasing ranger and volunteer presence on the system to welcome and inform visitors.

② CCEI.3) CONNECT YOUTH TO THE OUTDOORS

Ensure youth get outside more by offering a continuum of educational and service-learning opportunities that fosters youth interest, competence and confidence in enjoying and conserving nature.

② CCEI.4) SUPPORT CITYWIDE ENGAGEMENT WITH FEDERALLY RECOGNIZED AMERICAN INDIAN TRIBES AND INDIGENOUS PEOPLES

Support citywide efforts to work in partnership with federally recognized American Indian Tribes and other city departments through formal government-to-government consultations to support American Indian Tribes and Indigenous Peoples’ connections to their ancestral homelands.

③ CCEI.5) FOSTER WELLNESS THROUGH IMMERSION IN THE OUTDOORS

Working with schools and organizations, raise awareness of how open space improves physical and mental well-being.

③ CCEI.6) INSPIRE ENVIRONMENTAL LITERACY AND NEW INVOLVEMENT IN OSMP

Build the capacity of environmental education to inspire collective stewardship and climate action through comprehensive, collaborative programming across the system.

② CCEI.7) CULTIVATE LEADERS IN STEWARDSHIP

Advance skill-building and training for volunteers and stewards through expanded mentorship and leadership opportunities that increase OSMP’s capacity to address needs and support career development in open space management.

③ CCEI.8) HEIGHTEN COMMUNITY UNDERSTANDING OF LAND MANAGEMENT EFFORTS

Heighten community and neighborhood understanding and involvement in OSMP management and planning efforts through targeted education, outreach and in-person engagements in support of on-the-ground action.

③ CCEI.9) PRESERVE AND PROTECT BOULDER’S CULTURAL HERITAGE

Complete and maintain a cultural resource inventory and management plan to improve the protection of cultural resources and landscapes and to connect all people with Boulder’s past.

FOCUS AREA

Financial Sustainability (FS)

Value statement: We steward public funding to fulfill the City Charter purposes for open space.

FS OUTCOMES

FS.A) LASTING VALUE FOR THE COMMUNITY

OSMP effectively and efficiently manages city taxpayer dollars to build both trust and lasting open space value.

FS.B) RESILIENCE TO CHANGE

Financial management strengthens adaptability and resilience to local, national and global market forces and environmental change.

FS.C) PROTECTED INVESTMENTS

The community’s long-term investment in open space is protected or enhanced by prioritizing maintenance of OSMP properties and assets.

FS.D) PRIORITIZED ACQUISITIONS

Strategic acquisition of land, mineral and water interests continue to play an important role in preserving, enhancing and managing Boulder’s legacy of preservation, agriculture and passive recreation.

FS.E) EFFECTIVE COMMUNICATION

Financial information is proactively and clearly communicated to promote accountability, increase community understanding of OSMP financial management, and ensure alignment of spending with community priorities.

FS STRATEGIES

FS.1) STABILIZE FUNDING

Steadily generate funds through sales and use tax collections while strategically leveraging other revenue streams and local dollars to support OSMP’s capacity to deliver open space services.

FS.2) BUDGET FOR FUTURE UNCERTAINTY

Create, optimize, and manage budgets that anticipate major change drivers such as extreme weather events and fluctuations in revenue and spending.

FS STRATEGIES (Continued)

FS.3) UNDERSTAND TOTAL COST OF SYSTEM MANAGEMENT

Adopt or create models to understand the total value and cost of managing the OSMP system and its many diverse assets, including impact and investment tracking for upfront and ongoing costs regarding land management, agriculture, trails and other infrastructure.

FS.4) TAKE CARE OF WHAT WE HAVE

Focus capital investments on retaining the health of ecosystems on OSMP properties, as well as maintenance of existing trails, amenities and agricultural infrastructure.

③ FS.5) PRIORITIZE ACQUISITIONS IN BOULDER VALLEY’S RURAL PRESERVATION AREA

Prioritize opportunities to acquire land, mineral and water interests in the Area III - Rural Preservation Area – of the Boulder Valley Comprehensive Plan to advance its goals, OSMP Master Plan focus areas and City Charter purposes for open space.

③ FS.6) PARTNER TO PROTECT LANDS BEYOND THE PRIORITY AREA

Consider acquisition of land, mineral and water interests outside the Boulder Valley Comprehensive Plan boundary where partnership opportunities help leverage costs and advance OSMP Master Plan focus areas and City Charter purposes for open space.

③ FS.7) PARTICIPATE IN OTHER ACQUISITION OPPORTUNITIES

Consider acquisition of land, water and mineral interests within Area I and II of the Boulder Valley Comprehensive Plan only when coupled with planning, development or annexation projects or where citywide priorities or partnership opportunities emerge.

FS.8) EVALUATE EXISTING REAL ESTATE ASSETS ON OSMP LANDS

To improve the protection of, and align with, open space purposes in the City Charter, assess real estate assets and explore alternative preservation and stewardship options to better enable staff to steward and manage for those purposes.

FS.9) INVEST IN WORKFORCE DEVELOPMENT AND OPERATIONAL NEEDS

To provide effective management of the OSMP system over time, maintain a team-oriented workforce that benefits from experience and ongoing training and is equipped with adequate resources to meet the expectations of the community.

FS.10) UPDATE PLANNING FRAMEWORK

Refine OSMP planning methods and products to better inform and prioritize the efficient use of limited funding.

Implementation Priorities and Funding

All the above 46 strategies across the five focus areas are important, and they are all designed to guide our work over the next decade. However, limits to our funding and time require a realistic view of what is achievable to develop a shared understanding about what to expect and when.

To that end, we asked residents how we should prioritize spending on Master Plan implementation. Ecosystem health and resilience came out as most important to fund, with opportunities to enjoy and protect nature closely following. We also heard strong guidance to protect the substantial investment our community has made in open space and to prioritize conservation and maintenance of our existing system. Other input from the community is reflected in the prioritization of the strategies including:

- » preparing for extreme weather events;
- » engaging youth and underserved communities, including the Latinx community and those experiencing disabilities; and
- » addressing impacts to visitors' experiences and the natural environment in light of increased visitation trends.

This feedback helped us prioritize Master Plan strategies, leading to three tiers of priorities to guide funding for implementing the Master Plan vision. For example, depending on available funding, Tier 1 strategies would generally be prioritized above other implementation efforts and would be funded closer to the full need. Even as lower tier strategies, strategies in Tier 2 or 3 (shown in **Table 0.1** on page 36) are still important and critical for the management of Open Space. We will still put incremental funding and effort toward these, but with respectively less emphasis and depending on opportunities as they arise over the next 10 years. As we scale Master Plan implementation to available funding levels, additional funding for Master Plan implementation would provide more capacity to:

- » pursue conservation and restoration projects;
- » make additional progress toward reducing the trail maintenance backlog; and
- » incorporate more forward-thinking approaches to climate change, soil health, youth engagement, inclusion and volunteering.

Photo by Dave Sutherland





Figure 0.7: Rendering of pre- (top) and post-restoration (bottom) conditions along a stretch of creek. (Modified with permission from Left Hand Watershed Center, www.watershed.center)

For example, with additional funds we could restore more miles of lower Boulder Creek to transform formerly mined gravel pits into more natural habitat for native fish and amphibians. **Figure 0.7** illustrates before and after conditions for a typical creek restoration project. We could improve our Junior Ranger program to increase the number of high school students, who would, in turn, contribute substantially to our trails maintenance program. They may also help us close and restore undesignated trails. However, even in the best financial circumstances, we face realistic limitations or ongoing management challenges – like invasive weeds or trail maintenance needs – that staff will likely continue addressing well beyond the 10-year Master Plan vision.

A vital next step after the Master Plan is adopted is to develop a full understanding of the condition and total cost of the system by advancing an internal asset management approach. An asset management system will improve our ability to more accurately understand needs and estimate the cost of managing all aspects of open space including trails, volunteer programs, facilities and green assets. Nevertheless, the general cost ranges shown for each strategy in **Table 0.1** (on following page) reflect what it would take to fully implement the Master Plan’s 10-year vision for each strategy using the best figures we have to date. The cost range estimates can be understood as what we can reasonably anticipate as the cost of fully implementing the Master Plan vision over the next decade.

Table 0.1: Master Plan Strategies with Tier and Funding Needs*

TIER	STRATEGY	TEN-YEAR FUNDING NEEDS TO FULFILL MASTER PLAN VISION*
1	EHR. 1) Preserve and restore important habitat blocks and corridors	\$\$\$\$\$
1	EHR. 2) Update and continue implementing system plans guiding ecosystem management	\$
1	EHR. 3) Address the global climate crisis here and now	\$\$
1	ATT. 1) Reduce maintenance backlog for agriculture and water infrastructure	\$\$
1	ATT. 2) Increase soil health and resilience	\$\$\$\$
1	ATT. 3) Address conflicts between agriculture and prairie dogs	\$\$\$
1	RRSE. 1) Assess and manage increasing visitation	\$\$
1	RRSE. 2) Reduce trail maintenance backlog	\$\$\$\$\$
1	CCEI. 1) Welcome diverse backgrounds and abilities	\$\$
1	CCEI. 2) Enhance communication with visitors	\$\$
2	EHR. 4) Reduce undesigned trails	\$\$
2	EHR. 5) Extend on-trail requirements	\$\$
2	EHR. 6) Control invasive species	\$\$\$
2	EHR. 7) Develop a learning laboratory approach to conservation	\$\$\$
2	ATT. 4) Protect water resources in a warmer future	\$
2	ATT. 5) Encourage diverse and innovative agricultural operations	\$\$\$
2	RRSE. 3) Update guidelines and standards for quality trail design and construction	\$
2	RRSE. 4) Encourage multimodal access to trailheads	\$\$\$
2	RRSE. 5) Manage passive recreation activities requiring an OSMP permit	\$
2	CCEI. 3) Connect youth to the outdoors	\$\$\$\$
2	CCEI. 4) Support citywide engagement with federally recognized American Indian Tribes and Indigenous Peoples	\$

TIER	STRATEGY	TEN-YEAR FUNDING NEEDS TO FULFILL MASTER PLAN VISION*
3	EHR. 8) Reduce impacts from noise, light and nearby land uses	\$\$
3	EHR. 9) Reduce and offset OSMP greenhouse gas emissions	\$\$\$\$\$
3	ATT. 6) Support the success of ranchers and farmers	\$\$\$
3	ATT. 7) Integrate native ecosystems and agriculture	\$\$
3	ATT. 8) Further reduce or eliminate pesticide use	\$\$
3	ATT. 9) Enhance enjoyment and protection of working landscapes	\$\$\$
3	RRSE. 6) Support a range of passive recreation experiences	\$\$
3	RRSE. 7) Build new trails as guided by past and future plans	\$\$\$\$
3	RRSE. 8) Provide welcoming and inspiring visitor facilities and services	\$\$\$\$\$
3	RRSE. 9) Develop a learning laboratory approach to recreation	\$\$
3	CCEI. 5) Foster wellness through immersion in the outdoors	\$\$
3	CCEI. 6) Inspire environmental literacy and new involvement in OSMP	\$\$\$
3	CCEI. 7) Cultivate leaders in stewardship	\$\$
3	CCEI. 8) Heighten community understanding of land management efforts	\$\$
3	CCEI. 9) Preserve and protect Boulder’s cultural heritage	\$\$\$
3	Acquisitions (FS.5, FS.6, FS.7)	\$\$\$\$\$

KEY*		
\$	\$0 to 500,000	*The key defines dollar ranges for 10-year funding needs according to the highest potential funding level we might expect for Master Plan implementation. As such, they align with our full funding scenario as seen in Section 3 of the Master Plan.
\$\$	\$500,000 to 2,000,000	
\$\$\$	\$2,000,000 to 5,000,000	
\$\$\$\$	\$5,000,000 to 10,000,000	
\$\$\$\$\$	\$10,000,000 to \$40,000,000	

Our Shared Future

Seen as a complete and complex system, the Master Plan describes an integrated, collaborative, and realistic vision for the next decade of OSMP management. It inspires working with partners, volunteers and community members to bring this vision to life. As the voice of the people, the Master Plan also reflects the deep appreciation we all have for the land, and the profound sense of place it engenders. It establishes a framework of mutual support, in which we can find and enhance relationships among the focus areas, values, outcomes and strategies to implement our vision efficiently and together.

None of us is alone in the shared responsibility of protecting critical habitat, or of sharing what we know about nature to inspire its careful stewardship. We can all enjoy connections with nature and unite around a central purpose of caring for it, both for its inherent values and for the benefit of current and future generations. We can bring success to many parts of our open space system if we continue to put our minds, energies and resources toward it.

The OSMP Master Plan continues our shared legacy. It sets our course for the next decade and rallies all of us to protect and enjoy these open spaces long into the future. Over the next year, staff will start down that path by developing work plans that align with and advance the community's vision. Emerging in 2020, this enhanced implementation process will define the programs and projects that achieve Master Plan outcomes for each focus area and how we will deliver on the plan's strategic guidance. We will also lay out the types of planning efforts required to manage the system thoughtfully, so we continue to look forward together.

Right: Photo by
Thorne Nature
Experience





Above: Photo by
Christian Nunes

SECTION 1

OUR FOUNDATION OF INFORMATION



Left: Photo by Stephen Shelesk

Our Conservation Legacy

For the City of Boulder’s Open Space and Mountain Parks (OSMP) system, everything begins with land conservation. Without it, Boulder would not be Boulder. The city protects large tracts of important habitat for native plants and animals and connects people with these vast natural spaces. This legacy of stewardship and enjoyment has been a long time in the making – over 120 years! Our community’s dedication to protecting nature has culminated in a robust open space system nearly three times the size of the city itself, serving both the local community and the region.

Beginning with a purchase near Chautauqua in 1898 and Frederick Law Olmsted Jr.’s call to preserve Boulder’s scenic mountain landscape in 1910, more than 46,000 acres of public land have been protected (System Overview, 2018). As we look to the future of our conservation legacy, the vision of an interconnected open space system enveloping Boulder is nearing completion.

Today, open space wraps the city with grassland prairies, working agricultural lands, iconic Flatirons and forested foothills. Intersected by three major creeks, these features are uniquely preserved at the junction of the Great Plains and Rocky Mountains. This remarkable open space system has led to national recognition as the “happiest city in the United States” because of its safe and convenient access to open space (National Geographic, 2017).

Even more, the land, air and water provide an abundance of cultural, recreational, agricultural and ecosystem benefits, many of which are documented in OSMP’s [2018 System Overview Report](#), a foundational document describing the current state of our lands.

SECTION 1 OUR FOUNDATION OF INFORMATION

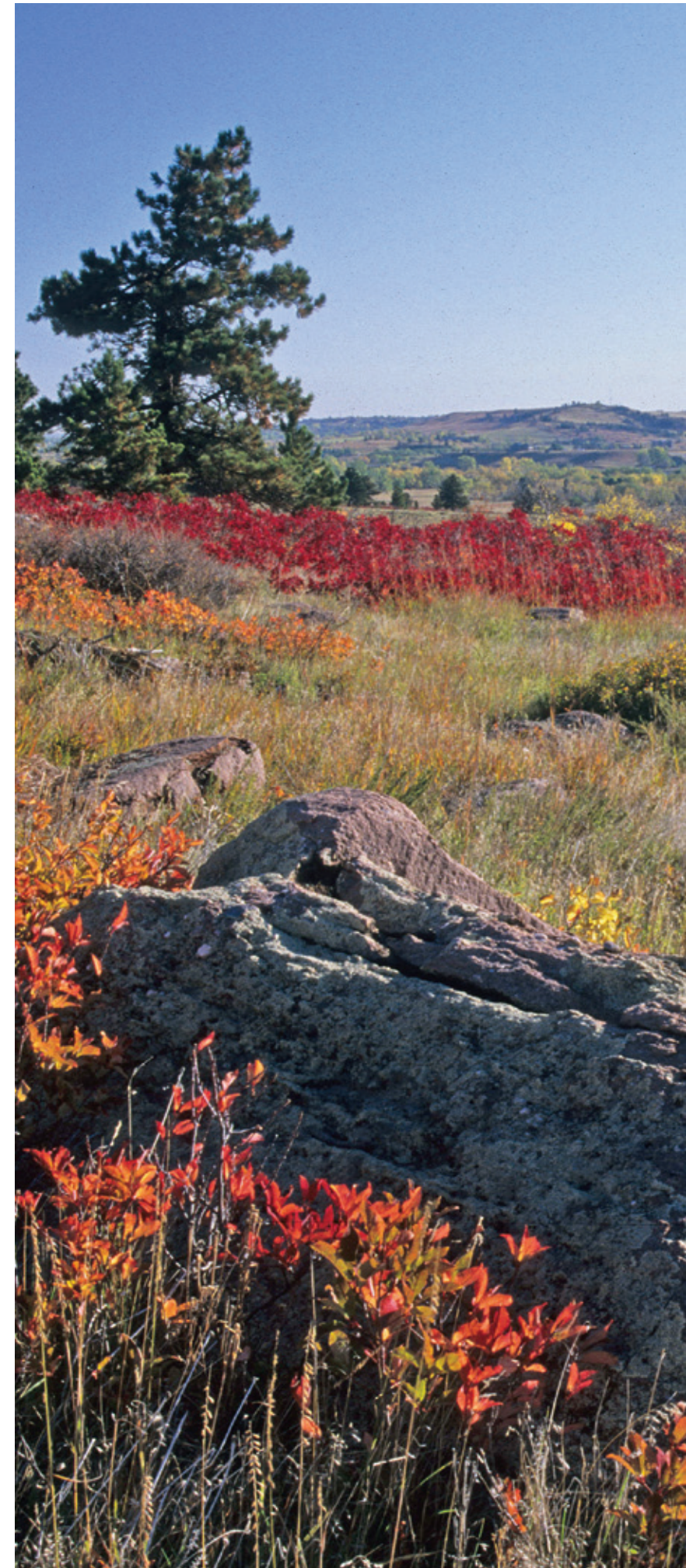
An Overview of Our System

The 2018 System Overview Report highlights the following about Boulder’s open space program:

- » Two continental-scale ecoregions, the Central Great Plains and the Southern Rocky Mountains, merge within Boulder’s open space system. The convergence of forested foothills and prairie grasslands – two of OSMP’s major ecosystems – have helped to create some of the most diverse habitats for wildlife and plants in the West.
- » OSMP lands support a host of native species, including more than 740 species of plants, 300 bird species, 130 species of butterflies, 60 species of mammals, 20 reptile and amphibian species and 15 species of fish. These lands also host some of the highest-quality cliff-nesting raptor habitats in the western United States.
- » OSMP monitors more than 80 ecological indicators to assess the health of OSMP forest and grassland ecosystems. On a scale of good-fair-poor, these indicators suggest that the overall state of OSMP forests and grasslands are fair. Non-native species and disturbances to streams and creeks present ongoing challenges to improving these conditions.
- » There are currently 11 active restoration projects on over 500 acres of OSMP’s grasslands, wetlands and riparian ecosystems. As of 2019, OSMP has also treated more than 1,900 acres of forested land to improve the health of open space forests and to reduce the fire danger for Boulder neighborhoods.
- » For over 120 years, open space has provided physical and mental benefits to the Boulder community through passive recreation. Today, OSMP maintains a 155-mile trail system and 113 trailheads and access points that connect visitors to diverse open space lands.
- » In 2017, OSMP public lands received an estimated 6.25 million visits (representing total number of visits as opposed to the total number of visitors), representing a 34 percent increase from the estimated 4.7 million visits in 2005.
- » OSMP works to foster enjoyment, protection of the land and improved quality of life for the Boulder community through environmental education, outreach, volunteering, service-learning, recreation activities, skill-building and law enforcement. According to feedback from OSMP educational programming, 100 percent of respondents said they would attend another of these programs with OSMP.

Right: Photo by Ann G. Duncan

- » OSMP is supported by our generous community. In 2018, 2,156 volunteers provided 18,810 hours of their time to help their public lands – contributing service valued at more than \$503,730 to open space.
- » One-third of OSMP land (15,000 acres) is leased by partner ranchers and farmers who contribute over \$1 million in services annually, increasing local food production while also supporting the health of native grasslands and wetlands.
- » OSMP land also protects natural scenery and ecosystem functions from the impacts of growth. For example, by preventing development in certain parts of the floodplains in Boulder Valley, OSMP lands help to protect high functioning floodplains and their many benefits.
- » OSMP has acquired more than 1,000 acres of wetland habitat and more than 170 miles of streams in the Boulder Valley.



Why A Master Plan?

In managing this unique and complex system, challenges are bound to arise. The Master Plan process – including engaging and listening to the community – has been critical in crystalizing where the system will need to be resilient in the coming years to withstand mounting pressures and foreseeable trends. Major pressure points include increasing visitation, retaining ecosystem health in the face of a climate crisis, increasing maintenance costs and a 30 percent reduction in city sales tax revenue dedicated to funding OSMP. Decreasing funding along with increasing visitation and a maturing land system to manage highlight the importance of developing a strategic focus for OSMP. As such, the Master Plan will help ensure conservation, maintenance and responsible stewardship of our existing natural areas and assets, while balancing the need for restoration, weed management and providing opportunities for enjoyment of our open space.

The [City Charter’s purposes for open space](#) informed and shaped the creation of the Master Plan’s five focus areas, which knit the charter purposes together into themes that organize policy direction for OSMP over the next decade and beyond. For example, the Ecosystem Health and Resilience focus area ties to certain charter purposes, such as Water, Landscapes and Ecosystems, and Natural Areas and Features or Species of Special Value. This focus area also corresponds to strong public support for protecting our open space system through conservation and preservation. Another example is the charter purpose Passive Recreation. Coupled with strong community support for recreational access and shared stewardship of OSMP lands, this charter purpose led to the **Responsible Recreation, Stewardship and Enjoyment** focus area.

In February 2018, the release of the System Overview Report launched an inclusive, collaborative 19-month public engagement effort around values, aspirations, strategies and priorities for Boulder’s lands as shown in **Figure 1.1** and discussed in detail in Appendix A. These efforts resulted in a shared vision for ways we will spend the next 10 years together enjoying and protecting the OSMP system. With the support of a united community, policy makers, stakeholders and staff, the strategic guidance in this document also brings our attention to the more distant future as we shepherd over a century of land conservation into the next 100 years.

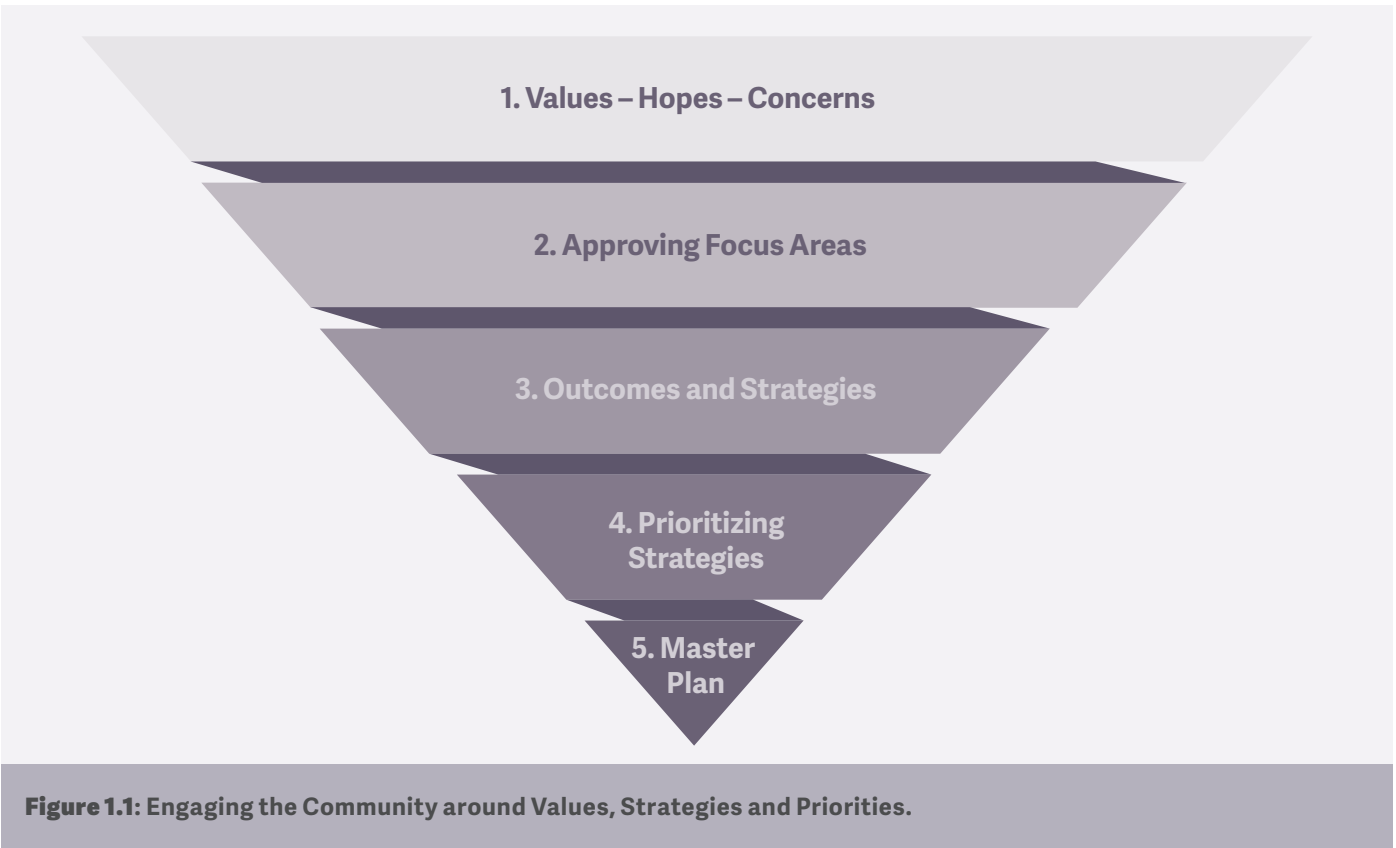


Figure 1.1: Engaging the Community around Values, Strategies and Priorities.

Advancing Existing Goals

As [Chapter 3 of the System Overview Report](#) describes, the Master Plan advances and aligns with established community-wide goals and plans including the Boulder Valley Comprehensive Plan, citywide guidance, and past OSMP plans. Section 2 of the Master Plan describes more specifically how each focus area or strategy supports or guides these interrelated citywide and OSMP plans.

BOULDER VALLEY COMPREHENSIVE PLAN

The Boulder Valley Comprehensive Plan (BVCP) is developed and jointly adopted by the City of Boulder and Boulder County to guide land use decisions in the Boulder Valley. Intended to integrate a range of community service areas, the BVCP provides high-level policies and goals to protect the natural

environment of the Boulder Valley while fostering a livable, vibrant and sustainable community. Adopted in 1977, the City of Boulder and Boulder County update the plan periodically, most recently doing so in 2017. The BVCP supports the community’s vision for balancing development and preservation of the Boulder Valley. The BVCP reflects the city’s sustainability and resilience framework, described below. In turn, the OSMP Master Plan and the city’s annual capital and operation budget outline the strategies designed to achieve BVCP’s goals.



Top: Photo by Dave Sutherland

Bottom: Photo by Ann G. Duncan



SUSTAINABILITY AND RESILIENCE FRAMEWORK

The City of Boulder is continuously working to fulfill its vision. The [Sustainability and Resilience Framework](#) provides a common language for all city departments, the local community and the Boulder City Council about what makes a great community. The framework aligns city government with a wide range of community priorities, to evaluate whether expectations are being met and to adjust, if necessary. To realize the city's vision of "service excellence for an inspired future," the Sustainability and Resilience Framework establishes seven broad outcome categories. The annual budget, as well as strategic plans and master plans, develop strategies to achieve those outcomes.

Elements of the Sustainability and Resilience Framework are:

- » Safe Community;
- » Healthy and Socially Thriving Community;
- » Livable Community;
- » Accessible and Connected Community;
- » Environmentally Sustainable Community;
- » Economically Vital Community; and
- » Responsibly Governed Community.

CITY VISION AND VALUES

OSMP staff and volunteers deliver services within a broad and integrated municipal governance model. To foster integrated operations, the city manager provides all city departments and staff guidance in the form of following a shared vision and set of values.

Citywide Vision:

- » Service excellence for an inspired future.

Citywide Values:

- » Customer Service;
- » Respect;
- » Integrity;
- » Collaboration; and
- » Innovation.

For a more in-depth description of the city's vision and values, please refer to the [city culture webpage](#).

OSMP GUIDANCE

Management of Boulder’s open space system is guided by the City of Boulder’s 1986 voter-approved City Charter, which defines open space purposes that inform decision-making. Sec. 176. Open space purposes – Open space land of the City Charter states that open space land shall be acquired, maintained, preserved, retained, and used only for the following purposes:

- a) Preservation or restoration of natural areas characterized by or including terrain, geologic formations, flora, or fauna that are unusual, spectacular, historically important, scientifically valuable, or unique, or that represent outstanding or rare examples of native species;
- b) Preservation of water resources in their natural or traditional state, scenic areas or vistas, wildlife habitats, or fragile ecosystems;
- c) Preservation of land for passive recreational use, such as hiking, photography or nature studies, and, if specifically designated, bicycling, horseback riding, or fishing;
- d) Preservation of agricultural uses and land suitable for agricultural production;
- e) Utilization of land for shaping the development of the city, limiting urban sprawl, and disciplining growth;
- f) Utilization of non-urban land for spatial definition of urban areas;
- g) Utilization of land to prevent encroachment on floodplains; and

- h) Preservation of land for its aesthetic or passive recreational value and its contribution to the quality of life of the community.

Open space land may not be improved after acquisition unless such improvements are necessary to protect or maintain the land or to provide for passive recreational, open agricultural, or wildlife habitat use of the land. (Added by Ord. No. 4996 (1986), 1, adopted by electorate on Nov. 4, 1986.)

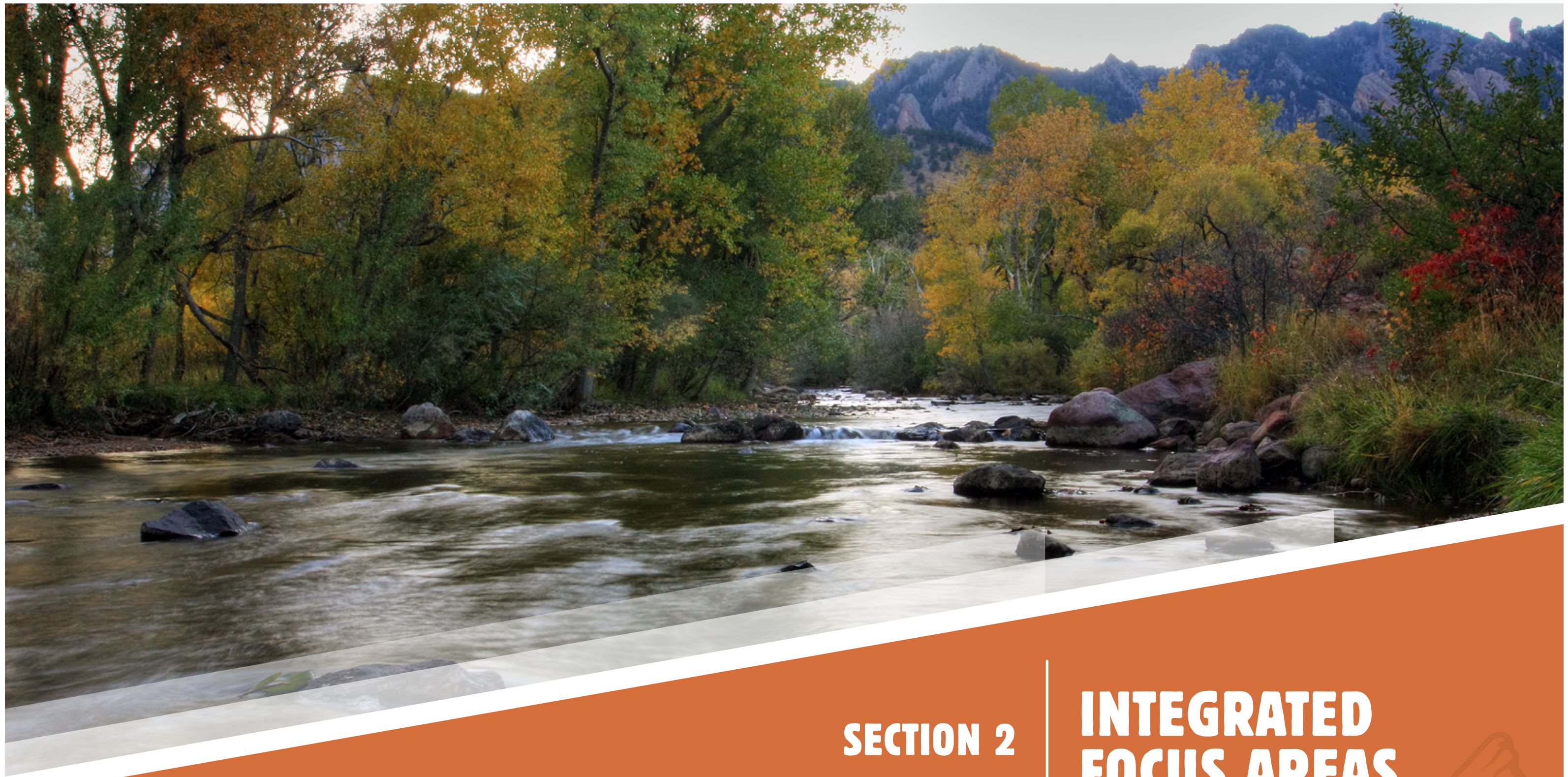
Building on this foundation, the Master Plan provides systemwide policy guidance that overarches and links together our existing plans, including:

- » [Agricultural Resources Management Plan](#) (2017);
- » [Open Space Acquisitions Plan](#) (2013);
- » [Grassland Ecosystem Management Plan](#) (2009);
- » [Visitor Master Plan](#) (2005);
- » [Forest Ecosystem Management Plan](#) (1999); and
- » Other [OSMP plans and policies](#) guiding trails and area management.

The Master Plan also helps staff prioritize implementation of past plans and, in some cases, recommends plan updates to incorporate Master Plan guidance and more recent needs. It also sets the course for updating our approach to planning, so we stay responsive and proactive in a changing environment. For each strategy, Appendix C provides a summary of related policy guidance from existing OSMP guidance.

**Right: Adobe
Stock Image**





SECTION 2

INTEGRATED FOCUS AREAS

Above: Photo by
Josh Coutts

Integrated Focus Areas

As an integrated whole, **Section 2** defines the community’s vision for the next decade. It describes our shared aspirations about the future of Boulder’s Open Space and Mountain Parks (OSMP) and the department’s means of achieving them together with our community. While the next section grounds this vision in financial realities, we spend time here describing our desired outcomes and strategies to inspire collective action and anticipate future opportunities.

We also recognize that our work together is never done. Invasive weeds, for example, or trail maintenance needs will continue to challenge staff and the community well beyond this ten-year Master Plan vision. But here we describe an agenda for the next decade that seeks to inspire and define our passion for open space, as well as ground our vision in a pragmatic reality that recognizes the challenges we face.

As such, this section starts to break this agenda down into three sets of priorities, with additional detail in **Sections 3 and 4**. Community members, staff, the Open Space Board of Trustees (OSBT) and City Council informed this prioritized approach (see Appendix A). Tier 1 strategies are the most important, requiring a greater emphasis in terms of staff time and funding, especially in the first few years of Master Plan implementation. Even as lower tier strategies, strategies in Tier 2 or 3 are still important and critical for the management of open space. We will still put funding and effort toward them as capacity allows and as opportunities arise, but with respectively less emphasis than Tier 1.

Section 2 is organized around a set of five focus areas that integrates all City Charter purposes for open space and guides us into the future. These focus areas draw our attention to the ways we as staff can further align service delivery with what matters most to our community. For each focus area, outcomes and strategies – developed with the community, Open Space Board of Trustees (OSBT) and City Council – will shape our work plans over the next decade and beyond. Our five Master Plan focus areas and supporting value statements are:

SECTION	FOCUS AREA	VALUE STATEMENT
2.1	Ecosystem Health and Resilience (EHR)	Using the best available science, we protect healthy ecosystems and mend those we have impaired.
2.2	Agriculture Today and Tomorrow (ATT)	Our legacy and future are based on working landscapes that are in harmony with nature.
2.3	Responsible Recreation, Stewardship and Enjoyment (RRSE)	We are united by our connection to and enjoyment of nature and our obligation to protect it.
2.4	Community Connection, Education and Inclusion (CCEI)	Together, we build an inclusive community of stewards and seek to find our place in open space.
2.5	Financial Sustainability (FS)	We steward public funding to fulfill the City Charter purposes for open space.

This section also integrates important data, trends and background information –which is further detailed in our [System Overview Report](#), a foundational document that shares information about the OSMP system. In

addition, [supplemental materials](#) developed to support community engagement in the fall of 2018 also provide background information that support the development of the outcomes and strategies that follow.



Left: Photo by Doug Goodin

Introduction

BOULDER'S WILD IDEA

In Boulder, the Great Plains and Southern Rocky Mountains merge in dramatic fashion, creating iconic rock formations, unmatched scenic beauty and high biodiversity. This natural heritage is a powerful and enduring reflection of Boulder's values. Together, we have spent decades protecting natural lands—from the 1898 purchase of the 75-acre Chautauqua Park, to the 1967 tax to purchase and care for lands, to the 1986 adoption of open space guidance in the City Charter. Through the Open Space and Mountain Parks (OSMP) Master Plan process, community members reaffirmed that preservation and protection of the natural environment is a core community value.

Broad engagement led to the **Ecosystem Health and Resilience (EHR)** focus area – and the value statement: *Using the best available science, we protect healthy ecosystems and mend those we have impaired.* In early 2018, one resident said “it is a very unique ecosystem with some of the greatest diversity on our continent. I can go 1,000 miles east or west and not find that diversity of plant and animal life.” According to the 2019 OSMP Master Plan Survey of Boulder Valley residents, 79 percent of respondents felt **Ecosystem Health and Resilience** should be one of the most important themes for guiding OSMP management in the future as can be seen in Appendix B.

At last estimate, OSMP lands support 741 native plant species, 303 native bird species, 138 native butterfly species, 61 native mammal species, 21 native reptile and amphibian species and 18 native fish species. These lands also host some of the highest-quality cliff-nesting raptor habitats in the western United States.

SECTION 2.1 ECOSYSTEM HEALTH AND RESILIENCE

Using the best available science, we protect healthy ecosystems and mend those we have impaired.



RAPID ENVIRONMENTAL CHANGE

Boulder’s natural lands lie side by side with a robust and growing urban environment, and they need thoughtful stewardship to maintain or improve their health. The pressures of human activities and environmental change have degraded some of our best waterways, wildlife habitats and native plant communities. Undesignated trails and invasive weeds have proliferated across the landscape, potentially fragmenting wildlife habitats and impairing the function of wetland and riparian areas. A warmer and more arid future, coupled with more frequent and intense fires and floods, will further challenge the protection of these natural lands.

Collaboration is vital to our resilience – as a community and as land managers. When we each address one need or opportunity, our efforts compound on each other, stewarding nature into an adaptable, high-functioning future. At the heart of our future successes will be partnerships with the U.S. Fish and Wildlife Service, Colorado Parks and Wildlife, the Colorado Natural Heritage Program, neighboring land management agencies, community organizations and nonprofits – as well as the thousands of residents and visitors who enjoy and help care for these lands. By setting our collective sights on a healthy future for nature, we ourselves will thrive.

Above: OSMP Image

OUTCOMES

Ecosystem Health and Resilience

The following outcomes describe our collective aspirations for **Ecosystem Health and Resilience** over the next decade and beyond. They describe ideal conditions we hope to achieve and inspire us to protect what we love most.

EHR.A) HIGH DIVERSITY OF NATIVE PLANTS AND ANIMALS	OSMP lands support a high diversity of native plants and animals, expansive natural areas and some of the most critical wildlife habitat along the Front Range.
EHR.B) RESTORED, RESILIENT HABITAT	Degraded habitat with high potential to support native or extirpated (i.e., locally extinct) native species is restored and made more resilient to stressors like invasive species or direct and indirect human impacts.
EHR.C) CLIMATE ACTION	OSMP is a leader in helping native ecosystems withstand and adapt to the effects of the climate crisis.
EHR.D) INFORMED, SHARED STEWARDSHIP	OSMP and the community work side by side to develop a greater understanding of the land and to safeguard our natural heritage.

STRATEGIES

Ecosystem Health and Resilience

The strategies below describe how staff will work towards achieving the desired outcomes for **Ecosystem Health and Resilience**. Organized into three tiers of importance to align with community priorities, strategies will directly inform staff’s work plans over the next decade and provide ways of communicating our progress to the public, the Open Space Board of Trustees (OSBT) and City Council.

THREE TIERS OF PRIORITY STRATEGIES

- TIER 1**
In the first few years of Master Plan implementation, staff will emphasize the following three high priority EHR strategies through an integrated set of prioritized programs, projects and planning efforts:
- » **EHR. 1) Preserve and restore important habitat blocks and corridors**
 - » **EHR. 2) Update and continue implementing system plans guiding ecosystem management**
 - » **EHR. 3) Address the global climate crisis here and now**

- TIER 2**
Over the next decade, we will also make steady progress towards the following four EHR strategies as funding and staff capacity allow:
- » **EHR. 4) Reduce undesignated trails**
 - » **EHR. 5) Extend on-trail requirements**
 - » **EHR. 6) Control invasive species**
 - » **EHR. 7) Develop a learning laboratory approach to conservation**

- TIER 3**
Lastly, we will make gradual progress as feasible toward the following two EHR strategies over the next ten years:
- » **EHR. 8) Reduce impacts from noise, light and nearby land uses**
 - » **EHR. 9) Reduce and offset OSMP greenhouse gas emissions**

Tier 1 Strategies

EHR.1) PRESERVE AND RESTORE IMPORTANT HABITAT BLOCKS AND CORRIDORS

Sustain, enhance, connect and restore habitat blocks with high ecological value and potential through conservation practices.

CONTEXT
This strategy is foundational as it captures much of the work the department does related to **Ecosystem Health and Resilience**. As such, it relates to other strategies throughout the Master Plan.

OSMP strives to both preserve and restore a network of healthy, resilient ecosystems for native plants and animals and ecosystem services like clean air and water. A key tenet of sound land management is the avoidance of disturbances that lead to habitat degradation in the first place, as costly restoration projects can improve condition, but rarely return a site to its original undisturbed state. We also acquire land that is often not in an ideal condition, relying on staff expertise to slowly improve the land and increase the resilience and diversity of native species. For example, after acquisition, properties at Gunbarrel Hill have undergone decades of careful restoration work to convert plowed agricultural fields into native grasslands.

A critical component of OSMP’s approach to preservation is the acquisition of large blocks of land and their protection or improvement. As stated in the Grassland Ecosystem Management Plan, block size may be an important aspect for assessing ecological health and resilience, as larger blocks:

- » Are more likely than small blocks to be self-sustaining;
- » Are better insulated from impacts from surrounding land use than smaller blocks;
- » Possess a higher diversity of species;
- » Support more biotic and abiotic processes, such as fire, grazing, predation and soil forming processes;
- » Are more resilient and better able to recover from extremes in natural or new disturbances;
- » Provide a fuller range of habitat variability;
- » Support the habitat needs of a wider range of species—both plant and animal;
- » Support species requiring large areas; and
- » Represent the best opportunity to conserve species sensitive to the effects of urbanization.

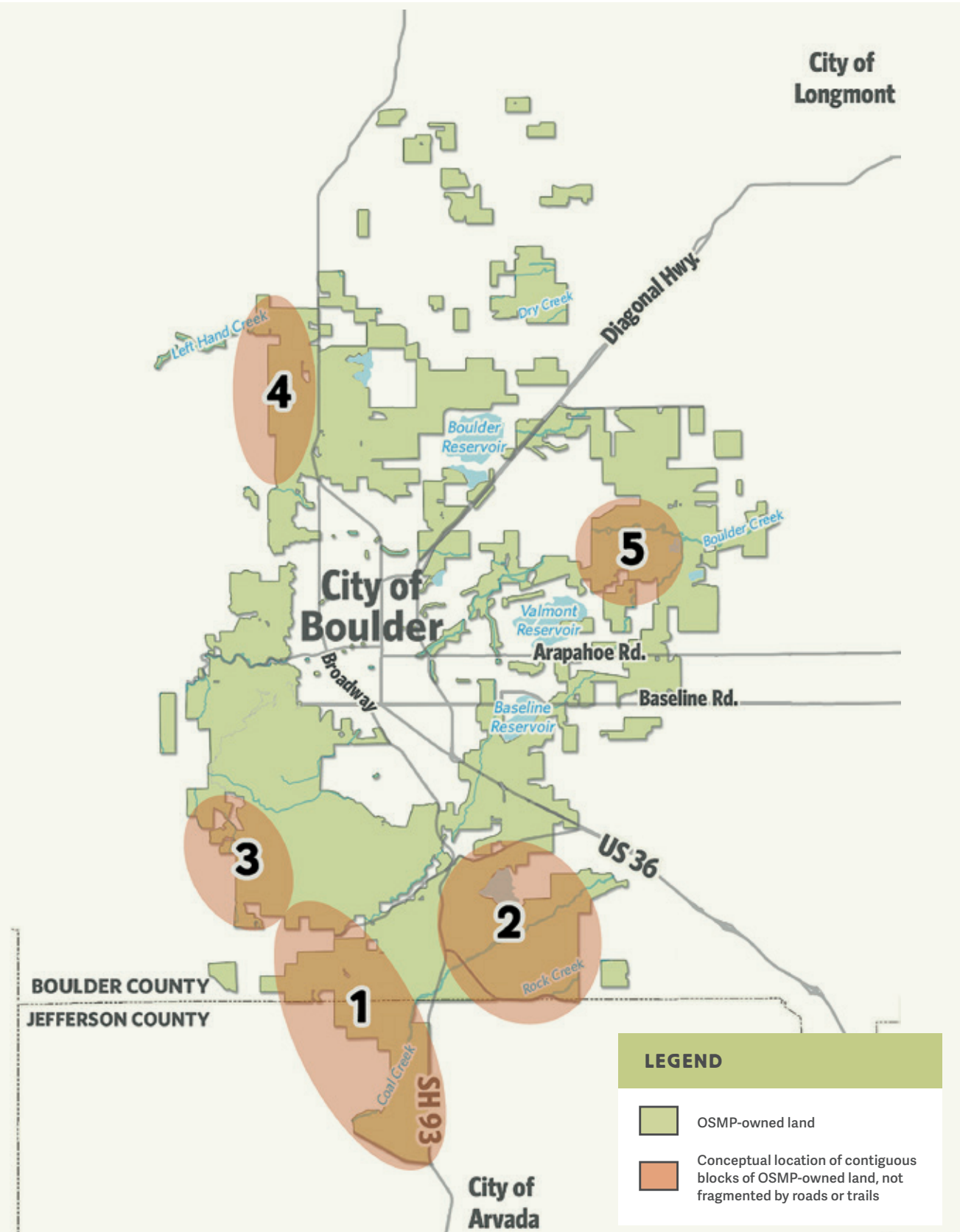


Figure 2.1.1: Illustration of Five of the Largest Blocks of OSMP-owned Land

Figure 2.1.1 conceptually illustrates the general location of five of the largest blocks of land owned by OSMP (1 being the largest). Each block is over 1,000 acres, and is typically adjacent to other public lands, which is in part why OSMP lands host wide-ranging species like elk, mountain lion, bears, and mule deer.

In Figure 2.1.1, the relative block sizes were determined based on an assumption that roads, designated trails, undesignated trails, and external OSMP property boundaries fragment or compromise otherwise larger habitat blocks. However, initial staff analysis reveals complexities with this assumption. For example, adjacent public and private lands that are in a natural state create larger swaths of land irrespective of ownership. Moreover, very low visitation on certain trails may not be a significant impediment to wildlife movement or ecosystem function.

Other important considerations – including habitat quality and connectivity at a landscape scale – require further analysis to serve as the basis for site-specific decision-making. For example, areas with dense invasive weed cover may effectively lower habitat quality and impact block size. Further, smaller blocks can provide strategic ‘stepping stones’ of high-quality habitat, supporting wildlife movement across a larger landscape (Crone 2019). Staff will continue this type of evaluation to better understand the most effective actions to conserve the relative value and importance of habitat blocks systemwide.

In addition to large blocks of habitat, wildlife corridors are a key feature of OSMP lands and other partner agencies with adjacent land. In fact, one of the few remaining undeveloped wildlife corridors in the Front Range, connecting the prairie to the alpine tundra, runs east-west through the southern part of the OSMP system. It is a critical corridor for species like mountain lions that need a vast area and variety of habitats for survival.

When land is disturbed or degraded, OSMP uses a range of restoration techniques to try to return conditions to acceptable levels. This includes very active restoration done after ground-disturbing events like flooding, as well as restoring ecological processes in intact forest or grassland ecosystems such as fire and grazing. We also consider environmental change in developing an adaptive approach to restoration.

TAKE-AWAY

While generations of Boulder residents have worked to preserve and protect both habitat blocks and corridors, our natural ecosystems need our help now more than ever. Ecological monitoring tells us these ecosystems are, on average, in fair condition (see [Chapter 5 in the System Overview Report](#)). Preservation and restoration of our most important habitats and corridors – from the small patches of rare plant species to huge land blocks that support top predators and herbivores – will become even more critical in the face of rapid environmental change.

COMMUNITY VOICES

Residents consider restoring degraded ecosystems and wildlife habitat to be the most important priority for allocating OSMP tax dollars (2019 OSMP Master Plan Survey) as can be seen in Appendix B.

EXAMPLE IMPLEMENTATION ACTIONS

This strategy will guide implementation projects to protect and enhance creeks, wetlands, wildlife corridors and all other elements of holistic ecosystem function, as well as targeted fire management practices in both our forests and grasslands. Implementing this strategy will also work in tandem with **EHR.7) Develop a learning laboratory approach to conservation**, as staff develop criteria, working with partners, to clearly define habitat blocks and evaluate the relative importance and condition of each. This process and information will in turn inform implementation of **EHR.2) Update and continue implementing system plans guiding ecosystem management**.

This strategy also captures on-the-ground programs and projects that our scientists have done over many decades. It guides staff to build on these successes through continued and enhanced efforts to preserve and restore ecological health and resilience. For example, staff will continue and enhance on-going habitat preservation initiatives, including:

- » Acquisition of large properties or areas adjacent to existing OSMP lands (see **FS.5, FS.6, FS.7**);
- » Acquisition of wetlands and land in floodplains (see **FS.5, FS.6, FS.7**);

- » Coordination of management with adjacent landowners, including Boulder County Parks and Open Space, Jefferson County Open Space, the U.S. Fish and Wildlife Service and others;
- » Monitoring conditions systemwide to characterize quality (see **EHR.7**);
- » Seasonal wildlife closures;
- » Education on Leave No Trace principles (see **CCEI.6**); and
- » Partnership with the Colorado State Natural Areas program.

We will also continue or enhance restoration projects, including:

- » Prescribed grazing or burning;
- » Forest thinning;
- » Restoration of undesignated trails (see **EHR.4**);
- » Invasive weed management (see **EHR.6**); and
- » Creek restoration.

Figure 2.1.2 displays areas across the system where forest restoration is most feasible, where grasslands conservation is a focus, and where restoration efforts are needed in our grasslands. In concert with **EHR.7) Develop a learning laboratory for conservation**, this strategy guides staff to keep this type of analysis up to date as it relates to the relative ecological value, needs and opportunities over time.

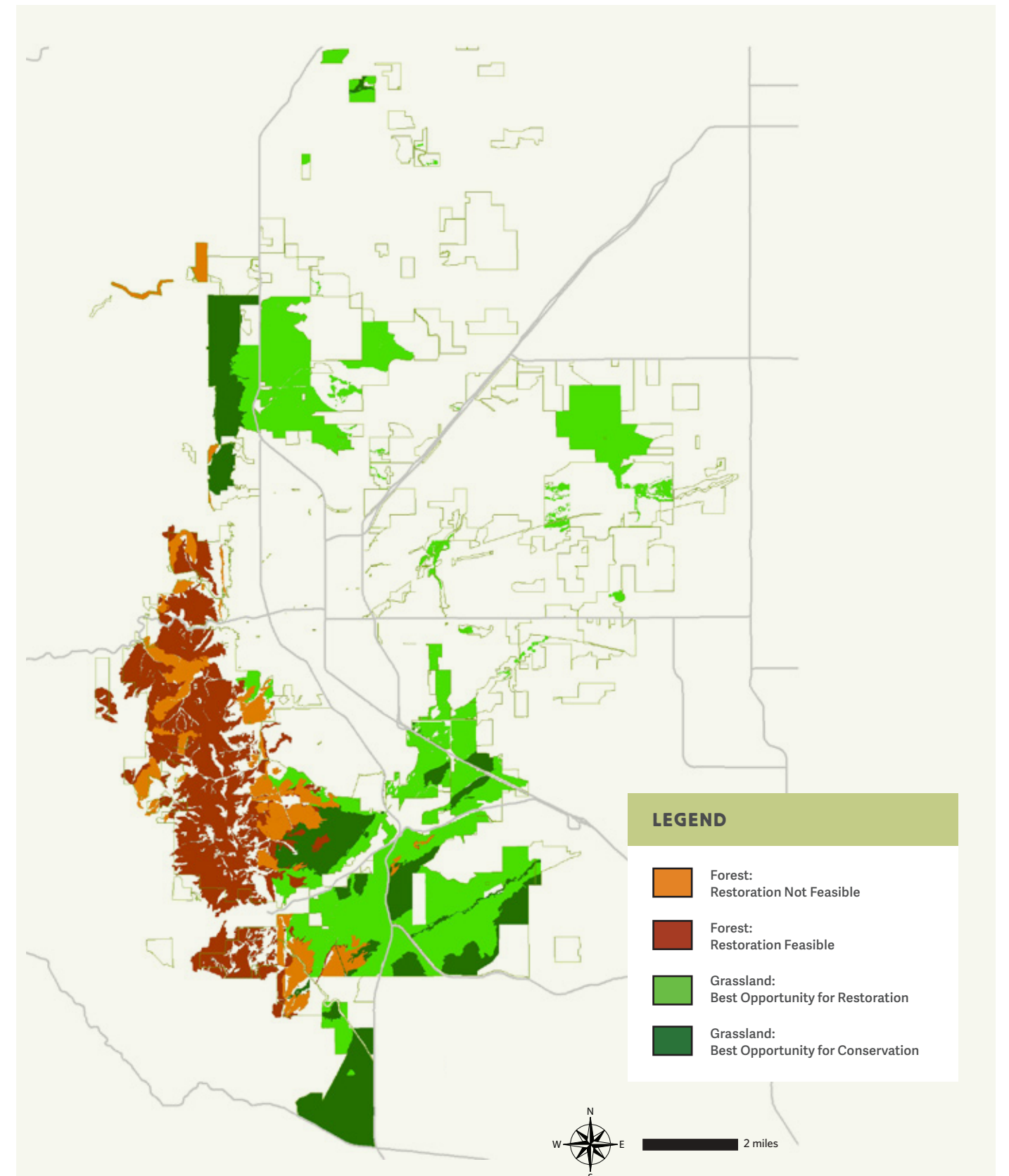


Figure 2.1.2: Best Opportunities for Conservation and Restoration

Riparian areas within Best Opportunity Areas for Restoration will also benefit from phased restoration projects. For example, projects along lower Boulder Creek in the northeastern part of the OSMP system will restore formerly mined gravel pits to more natural wetlands that can support native fish and amphibians. Staff will recontour the land, redistribute waste piles left over from mining operations, plant native vegetation, and manage weeds as native plants are establishing. Snapshots of current conditions and post reclamation monitoring will also contribute data to report on creek health (see **EHR.7**). **Figure 2.1.3** illustrates before and after conditions for a typical creek restoration project. **Section 3** of the Master Plan illustrates how this work would be scaled to match available funding levels.

As is often the case with important, large-scale efforts such as these, opportunities for environmental education and volunteer projects will also augment staff’s capacity and build a shared sense of ownership and stewardship among those who contribute (see **CCEI.6** and **CCEI.7**).

SUPPORTING GUIDANCE

Implementation of **EHR.1** is most informed by OSMP guidance found in the “Best Opportunity Areas” section of the [Grassland Ecosystem Management Plan \(2010\) \(Grassland Plan\)](#) and the “Habitat Conservation Areas” section and Appendix 4.1: Detailed Information on Management Areas in the [Visitor Master Plan \(2005\)](#). For some acquired properties, management area designations need to be established. The [Forest Ecosystem Management Plan](#) also includes specific management prescriptions (primarily thinning and prescribed fire) for forest stands along the urban/wildland interface. [Trail Study Area Plans \(2005-2016\)](#) include trail alignments, direction on closure/reclamation of undesignated trails and seasonal protections for wildlife that integrate this strategy with Strategies **RRSE. 6, 7 and 8**. The [Acquisition Plan \(2013\)](#) also prioritizes acquisition opportunities that protect large, intact habitat blocks, as well as riparian areas, wetlands and other areas of enhanced biological diversity.

Right: Photo
by Emilie
Gunderson



Figure 2.1.3: Rendering of pre- (left) and post-restoration (right) conditions along a stretch of creek. (Modified with permission from Left Hand Watershed Center, www.watershed.center)



EHR.2) UPDATE AND CONTINUE IMPLEMENTING SYSTEM PLANS
GUIDING ECOSYSTEM MANAGEMENT

Update the Grassland and Forest Ecosystem Management Plans and continue managing entire ecosystems by considering all elements and processes of natural systems rather than focusing on one species or attribute at a time.

CONTEXT

Managing entire ecosystems and key ecological processes, such as fire, flood and drought, is the most efficient and beneficial way to foster biodiversity and support resilient systems. By defining a clear set of conservation targets for our two major ecosystems – forests and grasslands, the Forest Ecosystem Management Plan and the Grassland Ecosystem Management Plan are both examples of a comprehensive ecosystem management approach.

The Grassland Ecosystem Management Plan provides practical strategies to conserve the full ecological diversity of the grasslands in the Grassland Planning Area – as well as more than 50 ecological indicators to track the status of conservation targets. The table below reports the state of our grasslands as of 2010 to provide a complete systemwide look (Table 2.1.1). Together with recent monitoring data, we also know that conditions in the southern and southwestern grasslands are especially good.

In 2018, OSMP staff also commenced a grassland soils inventory project and used initial data to describe below-ground variation in soil properties (i.e., soil texture and soil nutrients) and to investigate the relationships among soil properties, native plant species diversity and land use history. This work on soils represents a renewed recognition of the essential ecosystem services that soils provide on city open space, including the promotion of native plant diversity in upland grasslands. For example, intact soils stabilize slopes, enhance ecological function, slow flood waters and promote native biodiversity for thousands of native plant species and millions of species of insects, bacteria and fungi. They also store atmospheric carbon dioxide (i.e., carbon sequestration). Thus, by conserving and restoring soils in natural areas, OSMP is also managing for the co-benefit of high carbon storage.

To understand the state of our forests, staff also study data regarding more than 30 management objectives from the Forest Ecosystem Management Plan, resulting in Table 2.1.2.

Table 2.1.1: State of the Grasslands as of 2010

KEY ATTRIBUTE	CONDITION	EXPLANATION
Landscape Context		
Connectivity	Fair	Specific to wetland and riparian areas, habitat is fragmented in places and vegetation buffer width is narrower than desired.
Fire regime	Fair	Upland grassland fire return intervals are too long to evaluate in a 10-year planning horizon.
Habitat effectiveness	Good	Number of bald eagle nest sites is as targeted.
Habitat structure	Poor	These indicators are specific to riparian.
Prairie dog occupancy	Fair/Good	Total acreage occupied is good, but distribution of prairie dogs in conflict areas is fair.
Size		
Agricultural production	Good	Acres in agricultural production is in the acceptable range.
Block size	Good	Some large blocks of grassland habitat are protected. Block size is a crucial attribute contributing to quality and function of natural systems.
Relative protected area	Very Good	This indicator is specific to White Rocks.
Condition		
Habitat Structure	Poor	Specific to riparian areas, the presence of exotic species and the interruption of disturbance regimes has caused even-aged canopies deviations of geomorphology from desired conditions.
Animal composition	Fair	Number of ponds that support native frogs is much lower than desired. Butterfly and bird occurrence and diversity is lower than desired.
Physical and chemical soil regimes	Unknown	
Vegetation and soils condition	Good	Grazed areas are in good condition.
Vegetation composition and structure	Fair	Native species richness is fair, but native species abundance is lower than desired.
Water quality	Unknown	
OVERALL STATE OF THE GRASSLANDS	FAIR	Lowest ratings are related to exotic plant species, native frogs and the quality of riparian areas.

Table 2.1.2: State of the Forests as of 2018

CATEGORY	CONDITION	EXPLANATION
Abiotic (soils)	Fair	Some soil erosion and compaction in treated forest stands.
Vegetation	Fair	Non-native species invasion has been a problem, but rare plant communities are in good condition.
Wildfire mitigation	Good	Successfully maintaining fuel breaks, fire road access and open-canopy forest stands.
Wildlife	Fair/Good	Maintained/created large snags and observed increase abundance of breeding bird species.
OVERALL STATE OF THE FORESTS	FAIR	Fire management is on track, but non-native species are a problem



Left: Photo by Jerry Bargar

In analyzing and applying these data to on-the-ground management, OSMP staff use an ecosystem approach to planning, where the primary goals are to sustain the integrity and diversity of ecosystems and the human societies that depend on them. Rather than seeing trees, wildlife, soils, or water separately, systems planning helps us see the entire complex of biotic, abiotic, and societal components present in a given area and to address them all in a holistic manner. For example, while we track the health of particular indicator species, such as the Grasshopper Sparrow, we do so in support of the larger grassland ecosystem that supports them. Because it helps us see and respond to the greatest needs and opportunities, this approach will continue to guide us as we update and apply ecosystem management plans.

TAKE-AWAY

As stewards of 46,000 acres of land that support high biodiversity, OSMP staff aim to move grassland and forest conditions into good overall condition through an adaptive management approach. Applying up-to-date inventory data to inform holistic ecosystem management planning will help focus future programs and projects on the greatest needs and opportunities in areas of greatest ecological value and significance.

COMMUNITY VOICES

Land management has been a key topic throughout the Master Plan process, even with younger visitors of city lands. A survey conducted by the Youth Opportunities Advisory Board found that nearly one-third of youth surveyed emphasized the importance of restoring land holistically (YOAB Survey, 2018), especially in the face of the emerging climate crisis.

EXAMPLE IMPLEMENTATION ACTIONS

Implementing this strategy will involve updating sections or modules of the Forest Ecosystem Management Plan and the Grassland Ecosystem Management Plan that need the most attention. This work will result in updated policy, programs and projects to improve ecosystem health and to keep land management current, effective and proactive.

Implementation will also involve ongoing monitoring to understand conditions over time. For example, a partnership opportunity with the University of Colorado will result in a systemwide inventory of soils on OSMP lands. Directed by the Grassland Ecosystem Management Plan, the Forest Ecosystem Management Plan, and the Agricultural Resources Management Plan, this work will increase basic understanding of soils and how management practices affect soil stability and fertility. As such, implementation of **EHR.2** will support **EHR.3) Address the global climate crisis here and now, EHR.7) Develop a learning laboratory approach to conservation and ATT.2) Increase soil health and resilience**, among others.

SUPPORTING GUIDANCE

The [Grassland Ecosystem Management Plan \(2010\)](#), and [Forest Ecosystem Management Plan \(1999\)](#) are the existing OSMP guiding documents that would be updated as part of this strategy. OSMP has identified the need for a water resources management plan, and that plan will also be relevant to this strategy. Guidance in the [Agricultural Resources Management Plan \(2017\)](#) is also relevant to this strategy.

EHR.3) ADDRESS THE GLOBAL CLIMATE CRISIS HERE AND NOW

For the benefit of natural ecosystems and future generations, exhibit environmental leadership by taking immediate, targeted and unified action in response to ecosystem changes that the global climate crisis will bring about.

CONTEXT

In Boulder today, it is significantly hotter than it was 50 years ago (see **Figure 2.1.4**), and an even hotter future likely awaits (Boulder’s Climate Commitment, 2017). This is important because Boulder lies in a semi-arid climate zone where water is already limited.

The climate crisis is already posing significant challenges to OSMP land and operations. More frequent and extreme natural disasters have become a reality, like the 2013 flood, which resulted in \$300 million of private property damage and \$27 million of municipal property damage. Efforts to improve the sustainability and resilience of trails and visitor facilities will become increasingly important for this reason (see **RRSE.3** and **RRSE.8**). Other potential impacts include more frequent and intense wildfires, upslope shifts in plants, earlier arrival of migratory birds, advanced blooming time of plants, loss of plant populations in hot microsites and increased spread of invasive species and pests (System Overview, 2018).

The climate crisis will also threaten our ability to preserve agricultural uses on OSMP lands (see **Section 2.2 Agriculture Today and Tomorrow**). For example, more carbon dioxide may lead to more crop yields, but higher temperatures, lower water availability and increased winter survival of pests will likely offset those gains. The timing and availability of forage for cattle also will likely become less certain, making ranching operations more unpredictable. A more arid future would also compound maintenance and management issues for agriculture.

To address the impacts of a changing climate, we must increase the capacity of ecosystems to buffer the impacts of extreme events like fires and floods. Some of this work involves integrating climate change mitigation into future resource and area plans. Other aspects of implementation involve on-the-ground action. For example, as of 2017, OSMP staff had improved forest ecosystems and reduced the risk of catastrophic wildfire by thinning trees in 1,500+ acres of overly dense forests (System Overview, 2018). Managing for larger habitat blocks will also increase resilience in plants and animals by decreasing the chance of human-caused disturbance (see **EHR.1**).

TAKE-AWAY

The climate crisis is a serious global challenge and we must act now if we are to preserve and adapt ecological functions on OSMP lands long into the future.

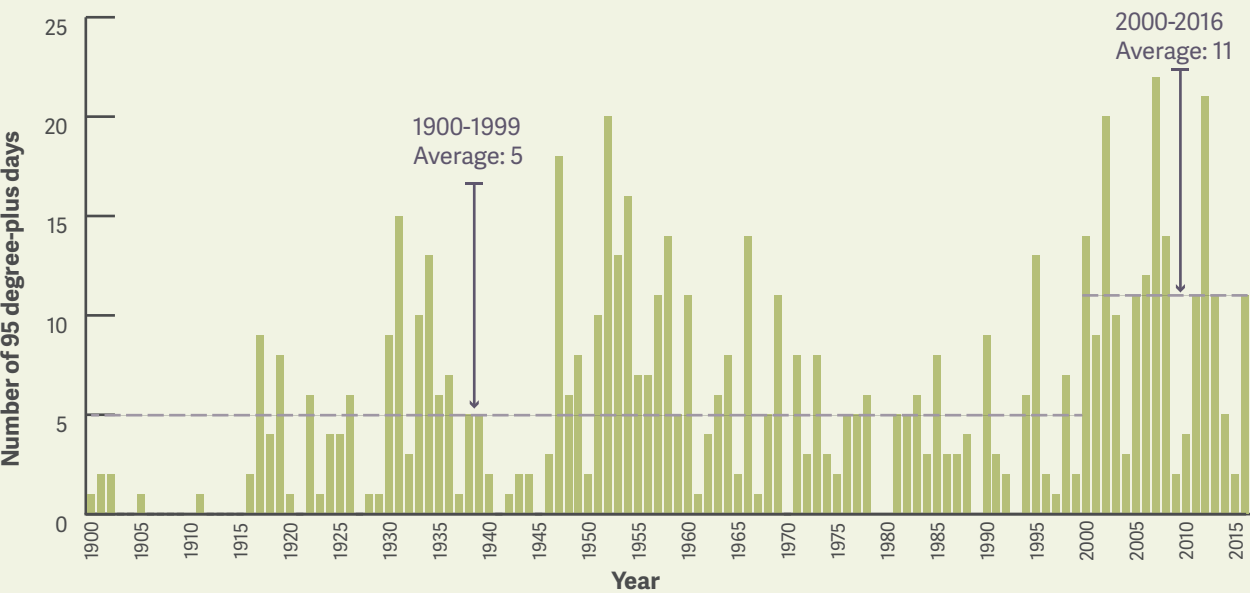
COMMUNITY VOICES

During the March 2019 community meeting, participants provided open-ended comments, with many addressing the importance of mitigating impacts of climate change. This sentiment echoed findings from youth-focused micro-engagements in the fall of 2018 where youth respondents thought OSMP should be managing the land with resiliency and climate change in mind while focusing on restoration.

EXAMPLE IMPLEMENTATION ACTIONS

Our response to the global climate crisis must necessarily be an integrated one. **Section 4** of the Master Plan describes a holistic approach to understanding impacts from the climate crisis on OSMP lands and the roles they play in addressing issues regionally and globally. That section describes example implementation efforts that will advance all focus areas on open space lands in pursuit of a resilient future for our ecosystems, our city and our community.

Figure 2.1.4: Boulder’s Extreme Weather History (Replotted with Rocky Mountain Climate and NCDC.NOAA.gov data)



As it relates to **Ecosystem Health and Resilience**, staff will continue and enhance our efforts to increase the capacity of our natural systems to withstand and adapt to a more variable future (see **EHR.1**). For example, the following projects help reinstate natural functions and increase the capacity of ecosystems to buffer the impacts of extreme events:

- » Prescribed burns;
- » Forest thinning;
- » Acquisition of floodplains to preserve the ecological functioning of floodplains and to prevent development that may encroach on floodplains; and
- » Stream, riparian, and floodplain restoration.

Working across other strategies in Ecosystem Health and Resilience, implementation would also include:

- » Limiting additional stress to wildlife by preventing or reducing disturbance from visitation and adjacent land use (**EHR. 5, 7**)
- » Increasing the ability of wildlife to move across the landscape by preserving and restoring large habitat blocks, including the restoration of undesignated trails (**EHR.1, 4**)
- » Preventing the spread of invasive weeds in novel climate conditions (**EHR. 6**); and
- » Reducing and offsetting greenhouse gas emissions related to OSMP departmental operations in support of the citywide climate commitment (**EHR. 9**).

Science staff will also support the citywide climate initiative by studying the latest regional, national and international data and trends affecting climate (see **EHR.7**). We will use this proxy data – as well as OSMP-specific trends – to model implications for the OSMP system, highlighting areas, habitats, and species of highest vulnerability. This data – as well as future planning and design efforts – will help determine more specific actions to increase resilience.

In addition, OSMP staff, in coordination with other departments, will explore future acquisition of water rights for in-stream flows (**FS.5, 6, 7**) and increase advocacy for and education around protecting the ecological resources threatened by the climate crisis (**CCEI.6**).

SUPPORTING GUIDANCE

The most relevant OSMP guidance regarding the climate crisis is contained in the [Forest Ecosystem Management Plan \(1999\)](#) and [Agricultural Resources Management Plan \(2017\)](#). The city's [Climate Commitment \(2017\)](#) and the [Boulder Valley Comprehensive Plan \(2017\)](#) provide especially important context for this strategy.

Right: Photo by
Teri Cook



Tier 2 Strategies

EHR.4) REDUCE UNDESIGNATED TRAILS

Guided by best practices or area-specific plans, mitigate resource impacts by restoring, designating, re-routing or recategorizing undesignated trails, especially in sensitive habitat areas, while considering appropriate routes to serve desired destinations for visitors.

CONTEXT

Since the 1970s, OSMP and others have studied human impacts on plants and animals, as evidenced by dozens of independent studies. Based on this and other outside research, findings show that unmanaged recreation can negatively impact soils, water quality, plants and wildlife (System Overview, 2018).

Among those impacts are undesignated trails – pathways that visitors create by going off the trails officially managed by OSMP staff, referred to as designated trails. Often, these undesignated trails emerge when visitors look for short cuts or try to access destinations not served by designated OSMP trails. Other times, OSMP signs along undesignated trails, intended to communicate regulations, often instead convey confusing messages for visitors, making it difficult to understand which trails are okay to use.

For EHR strategies, sensitive habitat areas can be understood as places with higher levels of significance and vulnerability including habitat for rare native plant and wildlife species; regionally imperiled and vulnerable plant communities; and plant communities with high diversity of native species and low abundance of non-native species.

When undesignated trails form, they fragment natural habitat for native plants, animals and biological communities, sometimes displacing wildlife or damaging rare plants. Public land managers across the country experience the same challenges and struggle to keep up with the resulting maintenance or restoration costs (see **RRSE.1 Assess and manage increasing visitation**)

As of 2018, more than 160 miles of undesignated trails were present on OSMP lands, down from almost 180 miles mapped in 2012. This change reflects the restoration, designation or revegetation of undesignated trails. However, the categorization of undesignated trails can be complex, and staff are working to update the categorizations to better understand what constitutes an undesignated trail. Also, our trail system is dynamic, and despite substantial efforts to reduce undesignated trails, new undesignated trails continue to emerge.

Below: Photo by Mike Crupi



COMMUNITY VOICES

Closing and restoring undesignated trails on OSMP lands will require strong support from the community, especially where undesignated trails are frequently used and have been established for an extended time. The 2019 OSMP Master Plan Survey showed strong community support (86 percent of respondents as shown in more detail in Appendix B) for reducing undesignated trails in sensitive habitat areas. These results provide a strong foundation for tackling the challenging task of addressing undesignated trails.

EXAMPLE IMPLEMENTATION ACTIONS

As called for in the 2005 Visitor Master Plan, staff is currently advancing this strategy by completing an updated systemwide inventory of undesignated trails to provide current information and develop different categorizations for the various types of undesignated trails seen on the system. We are also improving practices regarding how and where we place signs and fencing to clarify expectations for visitors and improve differentiation between designated and undesignated trails.



Left: Photo by Phillip Yates

This strategy guides staff to work closely with the community in accelerating the closure and restoration of undesignated trails, focusing first on the most sensitive habitat areas. Success will require engagement with neighborhoods, key affected visitors and the larger community. For example, staff can provide education programming, restoration projects and community members can volunteer to help care for their land. By working together, we can restore undesignated trails and consider ways to mitigate established uses that have unintended consequences for sensitive habitat areas.

SUPPORTING GUIDANCE

The [Visitor Master Plan \(VMP\) \(2005\)](#) considers how undesignated trails reflect patterns of desired visitor access. Both the VMP and the [Grassland Ecosystem Management Plan \(2010\)](#) offer guidance regarding the effects of the establishment and use of undesignated trails upon the sustainability of ecological systems, cultural resources, agricultural operations and provide strategies to reduce adverse effects. [Trail Study Area Plans \(2005-2016\)](#) provide site specific direction on which undesignated trails should be designated, re-routed and designated, or closed and reclaimed.

For nearly three-quarters of the system, past Trail Study Area plans have provided some level of guidance by identifying projects where a certain subset of undesignated trails should be designated, restored or re-routed. This approach has often resulted in successful action to address these issues. Where these commitments are still outstanding, staff will work to close undesignated trails and provide the public with information about the actions being taken.

In addition, staff will work with OSBT and the community through future planning processes to identify where else undesignated trails should be restored, rerouted or designated. In the meantime, staff may take rapid response actions as needed.

If undesignated trails exist outside of approved planning guidance, we will use best practices and coordinate staff work plans to prioritize and address the most pressing concerns.

For example, there is no current guidance for the eastern quadrant of the system, and staff are working on individual cases where there is a high need due to sensitive species in specific places. As planning for the eastern part of the system is undertaken (see **Section 4**), it will help establish a more holistic baseline for managing undesignated trails.

EHR.5) EXTEND ON-TRAIL REQUIREMENTS

Through future area planning, reduce off-trail travel in targeted locations, especially in sensitive habitat areas.

CONTEXT

Another way to improve ecosystem health and resilience is to promote on-trail travel. While OSMP encourages visitors to stay on-trail to protect plants and wildlife, visitors can move off-trail in designated areas across the system to explore other ways of experiencing the landscape. This strategy sets up future conversations about where and how staff may still support appropriate visitor experiences, while further encouraging or requiring more on-trail travel beyond current requirements.

On-trail travel requirements are not a new concept for OSMP visitors. Currently, mountain biking is only allowed on-trail and limited to trails especially designated for mountain biking. In addition, all visitors are required to stay on-trail in Habitat Conservation Areas (HCAs), which cover roughly one-third of the system. These 14,500 acres are managed to protect large blocks of the forested foothills, prairie grasslands and other special places. HCAs protect good examples of common habitats, as well as rare plants and animals, some of which are found

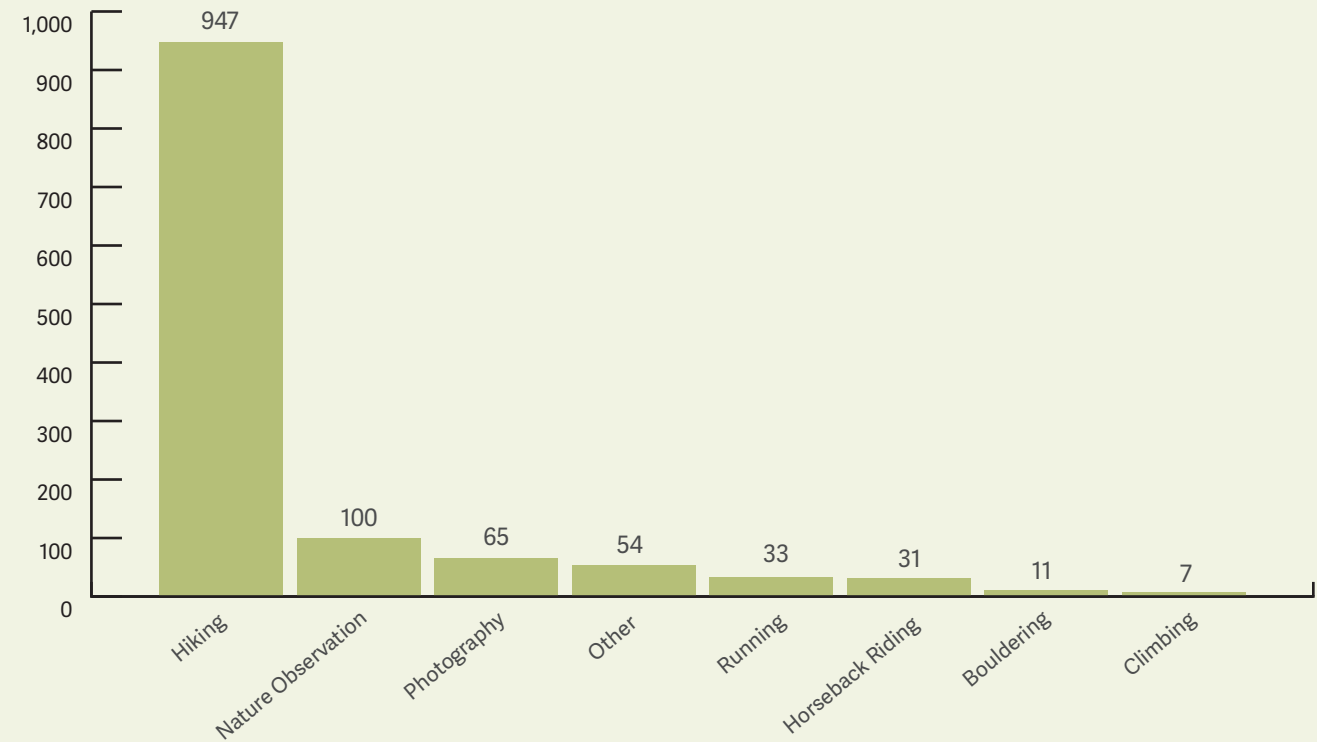
nowhere else in Colorado. In some HCAs, we provide permits to allow off-trail travel for specific uses. In addition, we also manage and enforce seasonal off-trail area closures to protect wildlife during nesting, breeding and other sensitive times of the year.

Staff observations and permit data suggest that most visitors stay on trail in HCAs, with fewer than 1,300 people using off-trail HCA permits a year on average. As **Figure 2.1.5** shows, hiking is most often the primary off-trail activity in these areas. Future planning will determine whether this off-trail permit system is appropriate for other parts of OSMP.

COMMUNITY VOICES

In the 2019 OSMP Master Plan Survey, one of the questions specifically related to trail management actions that OSMP could take to protect natural resources. Eighty three percent of respondents to this question would support OSMP extending the requirements for visitors to stay on managed trails to better protect sensitive habitat reas (44 percent strongly supported, and 39 percent supported as shown in detail in Appendix B).

Figure 2.1.5: Average number of people per year using off-trail permits in Habitat Conservation Areas between May 1, 2007 and May 1, 2019 by primary activity



EXAMPLE IMPLEMENTATION ACTIONS

This strategy guides staff to work closely with the community through future visitor use management planning efforts to consider where on-trail travel or the establishment and definition of on-trail corridors will best protect natural and agricultural resources while balancing the need to offer enjoyable passive recreation experiences.

SUPPORTING GUIDANCE

The [Visitor Master Plan \(VMP\) \(2005\)](#) guides OSMP to consider where off-trail activities that enhance the diversity of activities can be enjoyed on OSMP. Both the VMP and the [Grassland Ecosystem Management Plan \(2010\)](#) offer guidance regarding the resource effects of off-trail travel and provide a general approach to balancing enjoyment and resource protection. [Trail Study Area Plans \(2005-2016\)](#) provide site-specific direction and changes to the general direction in the VMP based upon resource sensitivity.

EHR.6) CONTROL INVASIVE SPECIES

Prioritize management and control of species that have severe and/or widespread impacts, particularly those that are non-native and most likely to be controlled.

CONTEXT

Twenty of the most invasive plant species statewide are present on OSMP lands. The use of prescriptive grazing to manage invasive species is a primary alternative to herbicides or other more labor-intensive management techniques such as hand pulling, whipping, and seed collection. However, often an integrated approach using multiple approaches is necessary to successfully control weeds.

For example, the presence of perennial, non-native tall oatgrass (*Arrhenatherum elatius*) has dramatically increased over the past 20 years, invading foothills and prairie ecosystems on OSMP properties (Tall Oatgrass Ecological Study 2018). Tall oatgrass forms dense stands that shade and out-compete native plants for light, moisture and nutrients. OSMP is undertaking a multiyear integrated approach to managing this invasive grass. In particular, we are evaluating the effects of prescriptive grazing, fire and herbicides on controlling its spread (**Figure 2.1.6**).

Another example involves efforts by our wildlife ecology staff to reduce impacts that non-native, invasive bullfrogs have on native Northern Leopard frog populations.

An invasive species is one that is typically non-native or alien to the ecosystem and causes economic or environmental harm and potentially harm to human health. The definition of invasive species is sometimes extended to include native species, when native species increase in abundance beyond desirable or historic levels, typically responding to a human-caused environmental change. For example, fire suppression contributed to the expansion and infilling of ponderosa pine (a native tree) and consequent outbreaks of mountain pine beetles (a native insect).

COMMUNITY VOICES

In the 2019 OSMP Master Plan Survey, less than half (44 percent) would support the targeted use of synthetic chemical sprays (herbicides) when other management approaches for managing invasive weeds have failed, highlighting the need for alternative approaches.

EXAMPLE IMPLEMENTATION ACTIONS

Depending on future funding and staffing levels, this strategy accelerates our research and management of weeds, including tall oatgrass and others. It expands the current program, requiring support from volunteers and partners to restore key areas in the system. Staff will focus implementation on areas where grazing is practical and where invasive species are most problematic and most likely to be controlled.

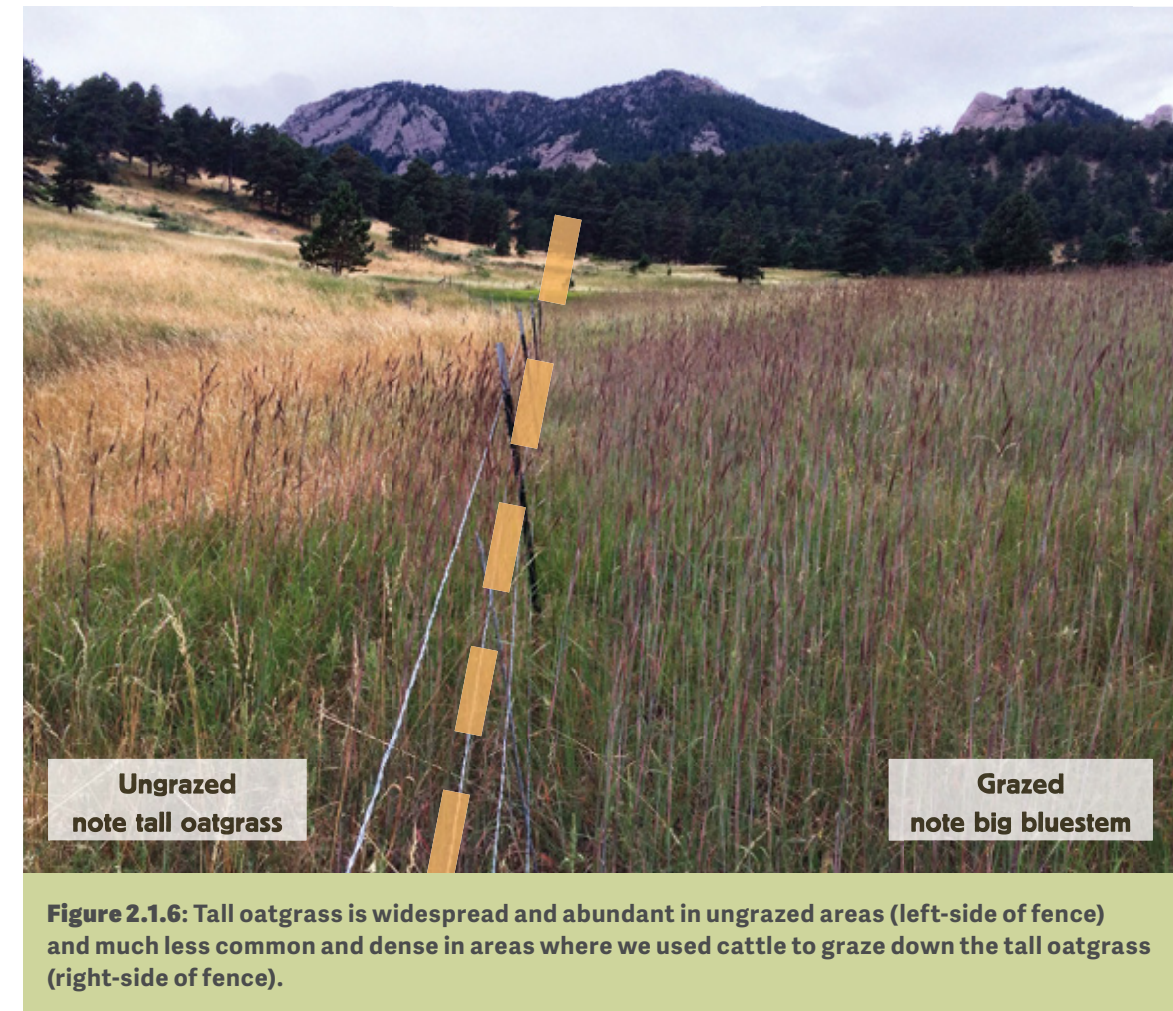


Figure 2.1.6: Tall oatgrass is widespread and abundant in ungrazed areas (left-side of fence) and much less common and dense in areas where we used cattle to graze down the tall oatgrass (right-side of fence).

This strategy also relates to and advances:

- » **EHR.4) Reduce undesigned trails:**
- » **EHR.5) Extend on-trail requirements;**
- » **ATT.8) Further reduce or eliminate pesticide use;**
- » **RRSE.3) Update guidelines and standards for quality design and construction.** For example, ecological best management practices for trail building can limit the spread of weeds and involve re-seeding with native plants.

SUPPORTING GUIDANCE

The [Forest Ecosystem Management Plan \(1999\)](#), the [Grassland Ecosystem Management Plan \(2010\)](#) and the Agricultural Resources Management Plan (2017) are the OSMP plans providing the most direction for this strategy, and integrated pest management in general.

EHR.7) DEVELOP A LEARNING LABORATORY APPROACH TO CONSERVATION

Conduct, support, apply and widely distribute the findings of long-term scientific research to inspire and engage community stewardship.

CONTEXT
OSMP uses science to further understand ecosystems and document their attributes, conditions and significance. Resulting data also helps detect changes in resource conditions and evaluate consequences of management actions. Each year we undertake dozens of monitoring projects, sponsor research grants and issue 30-50 research permits. There is also considerable community interest in citizen science programs and finding out more about the state of OSMP’s natural resources.

With this strategy, staff aim to inspire citizen science, community understanding, practical initiatives, pilots and catalyst projects to improve the city’s ability to recognize and respond to environmental trends. We will use the best available science and data to describe trends, inform stakeholders, support decision makers and increase our ability to meet the City Charter purposes for open space. Our goal is to develop and use this information to manage adaptively and to build confidence in land management decisions, even in the face of uncertainty. We also seek to encourage transparency, community stewardship and collective action by broadly sharing data, research results and trends.

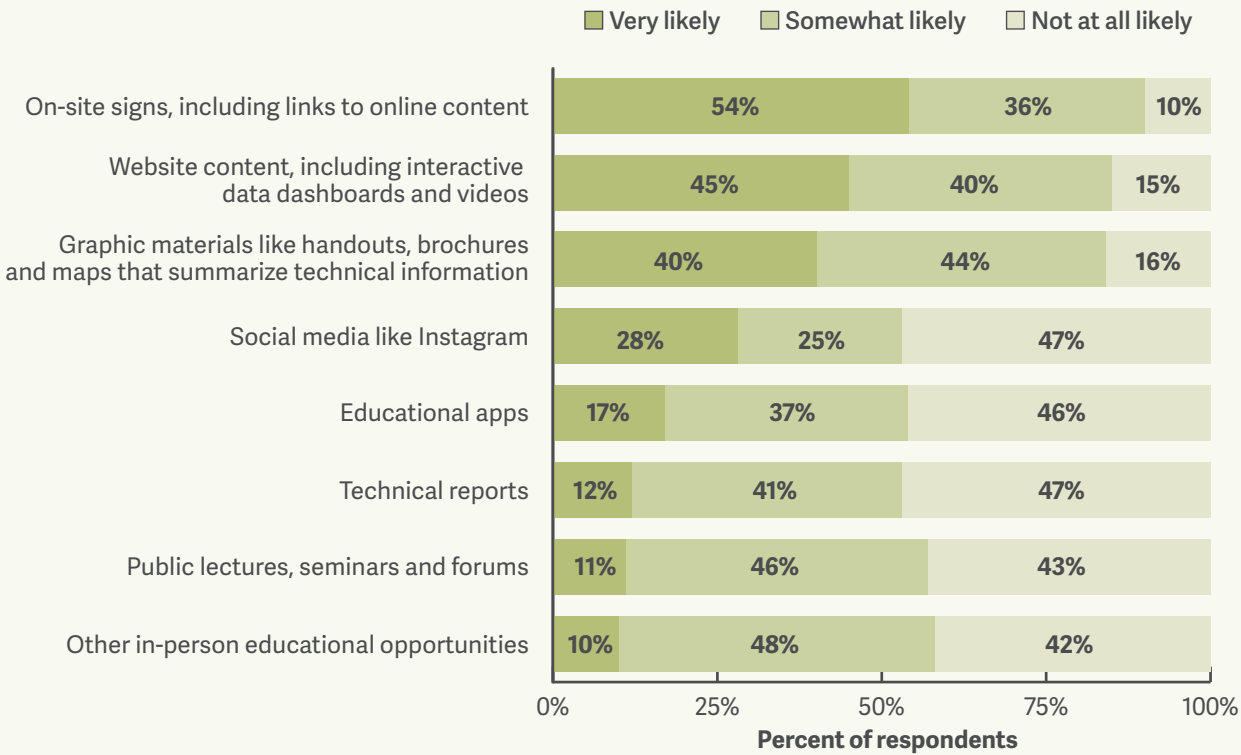
COMMUNITY VOICES
To understand how to share data and research findings, the 2019 OSMP Master Plan Survey asked residents how likely they would be to use certain tools to learn more about OSMP. As **Figure 2.1.7** demonstrates, the three most preferred methods were on-site signs, website content and graphical hard copy materials.

EXAMPLE IMPLEMENTATION ACTIONS
To develop strategies and best management practices for conducting and applying research and monitoring, staff must develop a program to describe successes to date, study and learn from our peers and secure resources. This strategy – and the Master Plan as a whole – helps OSMP staff focus our research agenda and capture existing commitments to monitor resources conditions over time. We will continue and enhance our funded and unfunded research programs, as well as collaborate with partner land management agencies to organize periodic research symposia.

This strategy also directs staff to widely share research findings to inspire community stewardship. As such, it advances many strategies in CCEI, including **CCEI.2) Enhance communication with visitors** and **CCEI.6) Inspire environmental literacy and new involvement in OSMP**. Moreover, this strategy relates to **FS.10) Update planning framework**. It guides future systemwide and area planning efforts by informing the development of a consistent inventory and assessment process to determine relative ecological value and

Figure 2.1.7: Question #21 Likely Use of OSMP Educational Methods

OSMP staff would like to improve the way they share data, trends, and information with the public about nature, recreation, agriculture, education, volunteering and cultural resources. How likely would you be to use each of the following to educate yourself?



strategy under **RRSE (RRSE. 9)**, in which we capture commitments to enhance our trails research program to better understand impacts from recreation on natural resources.

SUPPORTING GUIDANCE
The [Visitor Master Plan VMP \(2005\)](#), [Forest Ecosystem Management Plan \(1999\)](#) and [Grassland Ecosystem Management Plan \(2010\)](#) and [Agricultural Resources Management Plan \(2016\)](#) each identify important questions associated with

potential use of OSMP lands to answer critical research questions to improve land management practices. [The Trail Study Area Plans \(2005-2016\)](#) also identify site-specific monitoring to inform management decision making as a part of trial or pilot strategies.

Tier 3 Strategies

EHR.8) REDUCE IMPACTS FROM NOISE, LIGHT AND NEARBY LAND USES

Mitigate impacts to wildlife, sensitive habitat areas, scenic character or natural soundscapes from noise pollution, light pollution, and adjacent land uses.

CONTEXT

A direct human disturbance to ecosystem health, and wildlife in particular, is light and noise pollution (Shannon 2016; Longcore and Rich 2004). Noise can also affect visitors' experiences. In addition, nearby development – including conversion of adjacent properties to residential, commercial and industrial uses – can affect staff's ability to manage for City Charter purposes for open space. For example, nearby land uses can affect ecosystem function or scenic quality on OSMP land. Staff regularly participate in development review processes with City of Boulder and Boulder County staff to ensure that OSMP resources are protected and that visitor experiences are not negatively impacted.

COMMUNITY VOICES

During the Ecosystem Health and Resilience community workshop in October 2018, members of the Boulder community consistently stressed the importance of addressing recreational impacts to vital ecosystems and called for a better understanding of natural sounds and night skies in relation to development and transportation or aviation corridors (Third Engagement Window Summary Report, 2019).

EXAMPLE IMPLEMENTATION ACTIONS

This strategy would spur management action to study and protect natural sounds and night skies and support the citywide dark sky ordinance. To understand this problem, staff need to better understand how anthropogenic light and noise affect plants and wildlife on OSMP lands, determine desired conditions, and explore actions to mitigate problems. This will involve a review of available literature and best practices.

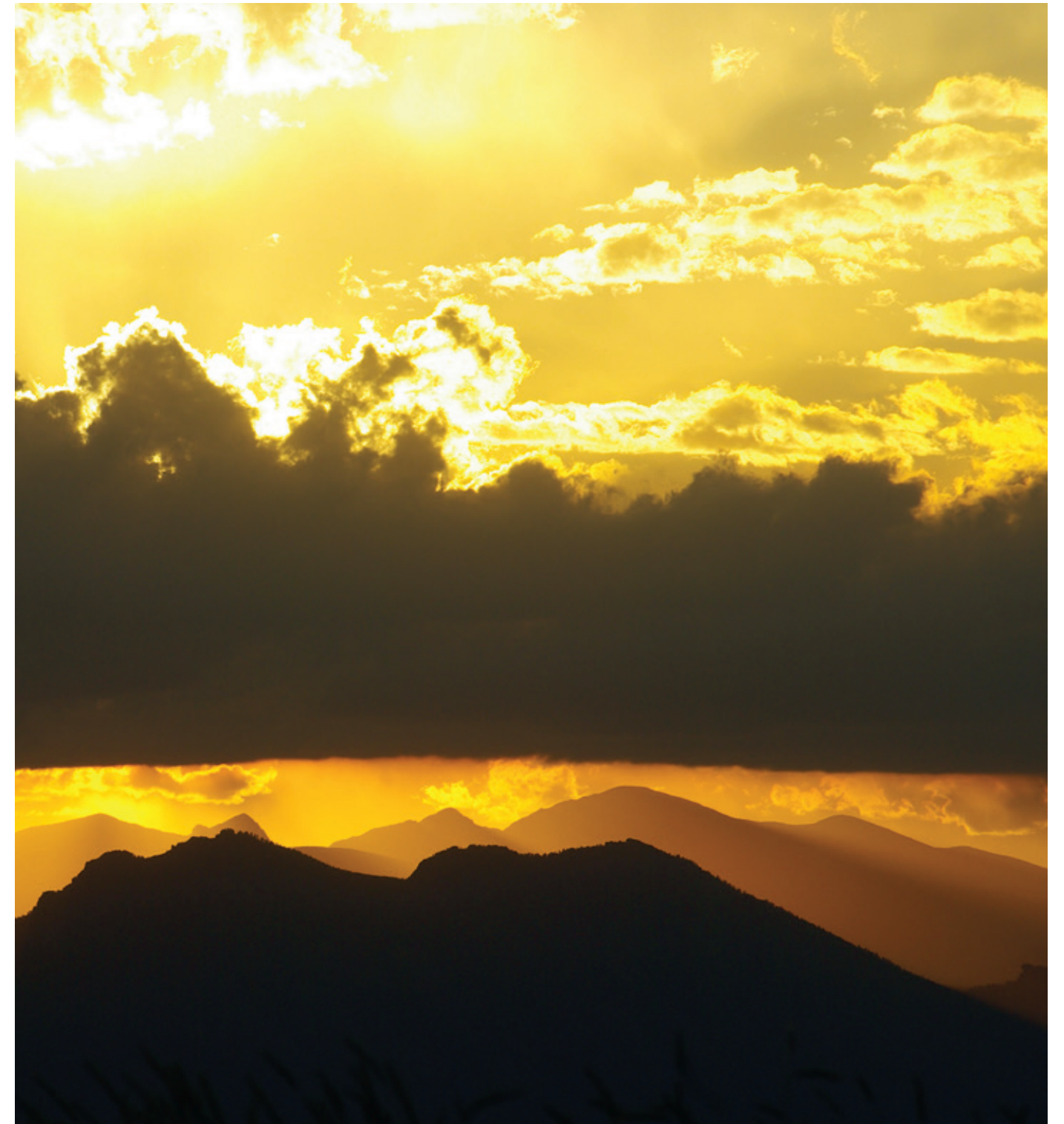
This strategy enables OSMP to establish a program to further explore and protect night skies and the natural acoustical environment. Staff will also collaborate with partners whose policies, decisions and actions can affect habitat and wildlife on our properties, and to ensure we can respond to new challenges. It requires we work even more closely with adjacent landowners, understanding that a healthy natural environment underpins our well-being, quality of life and economy.

This strategy also addresses disturbance caused by humans on adjacent properties, such as land conversion and energy development.

SUPPORTING GUIDANCE

The [Visitor Master Plan \(VMP\) \(2005\)](#), [Grassland Ecosystem Management Plan \(Grassland Plan\) \(2010\)](#), and [Forest Ecosystem Management Plan \(FEMP\) \(1999\)](#) provide background, objectives and strategies aligned with this Master Plan strategy. The [Trail Study Area Plans \(2005-2016\)](#) describe site-specific actions integrating considerations from the Grassland Plan, FEMP and VMP.

Below: Photo by Klaus Girk



EHR.9) REDUCE AND OFFSET OSMP GREENHOUSE GAS EMISSIONS

Support the citywide climate commitment by reducing and offsetting greenhouse gas emissions related to departmental operations.

CONTEXT

Climate change is attributed to increased levels of atmospheric carbon dioxide (CO2) and other greenhouse gases (GHGs) produced from the use of fossil fuels; and we want to play a part in reducing these inputs. However, reducing emissions will come with a price tag. For example, transitioning OSMP’s fleet to clean energy vehicles will be expensive. OSMP may be able to partially offset costs like these if we can earn credit for the large quantity of carbon that is stored on OSMP lands. Moreover, future management choices could even accelerate carbon storage on OSMP lands.

COMMUNITY VOICES

Community engagement frequently highlighted concerns regarding climate change related impacts on our OSMP lands. In particular, during the **Ecosystem Health and Resilience** community workshop we heard interest in maintaining diverse ecosystems to modulate temperatures, slow water runoff and store carbon (Third Engagement Window Summary Report, 2019).

EXAMPLE IMPLEMENTATION ACTIONS

This strategy urges staff to develop a program to reduce GHGs from our fleet. For example, city staff are identifying opportunities to reduce our GHG emissions from transportation, including city vehicles. OSMP staff support this effort and have, over time, been transitioning to lower emitting or electric vehicles when possible.

As climate change affects a broad spectrum of OSMP’s operations and lands, this strategy has synergies with the other focus areas. For example, implementation would also involve the creation of a program studying and experimenting with carbon sequestration in agricultural fields (ATT.2). Other opportunities to advance outcomes and strategies in **Agriculture Today and Tomorrow** may also involve exploring options for reducing greenhouse gas emissions from agricultural operations including livestock. It also relates to visitor travel and **RRSE. 4) Encourage multimodal access to trailheads**.

SUPPORTING GUIDANCE

The [Agricultural Resources Management Plan \(2017\)](#) includes a section describing agricultural management strategies associated with climate change preparedness and includes OSMP guidance relevant to this strategy. The City of Boulder [Climate Commitment \(2017\)](#) and the [Boulder Valley Comprehensive Plan \(2017\)](#) provide broader scale guidance relevant to this strategy.

Advancing Community-wide Goals

The Master Plan advances community-wide objectives described in the city’s Sustainability and Resilience Framework. For example, outcomes and strategies within the **Ecosystem Health and Resilience** focus area strongly support and align with the following objectives within this framework:

- » Environmentally Sustainable Community;
- » Safe Community; and
- » Livable Community.

The Master Plan also integrates and advances community-wide policies in the Boulder Valley Comprehensive Plan (BVCP) to OSMP lands and management practices. Outcomes and strategies within Ecosystem Health and Resilience strongly support and align with BVCP policies, including:

- » 3.01 Incorporating Ecological Systems into Planning
- » 3.02 Adaptive Management Approach
- » 3.03 Native Ecosystems

- » 3.04 Ecosystem Connections and Buffers
- » 3.07 Invasive Species Management
- » 3.08 Public Access to Public Lands
- » 3.09 Integrated Pest Management
- » 3.10 Climate Change Mitigation & Adaptation & Resilience
- » 3.20 Wildfire Protection & Management
- » 3.21 Preservation of Floodplains
- » 3.22 Floodplain Management
- » 4.01 Climate Action: Reduce Greenhouse Gas Emissions
- » 8.16 Trail Functions and Locations

Guidance in this focus area will also support community conversations in the future as the BVCP periodically gets updated.



SECTION 2.2

AGRICULTURE TODAY
AND TOMORROW

Our legacy and future are based on working landscapes
that are in harmony with nature.

Left: Photo by Tomasz Kucharski

Introduction

BOULDER’S AGRICULTURAL
HERITAGE

For over 150 years, Boulder’s lands and waters have served as the foundation of a strong, resilient agricultural system. In the mid-19th century, agricultural production developed in the Boulder Valley to supply the gold mining camps with food (Ag Plan, 2017).

Today, farmers and ranchers still work these same lands, providing food and products to the community and fostering a scenic legacy of pastoral barns and fields. OSMP preserves these agricultural uses to support agricultural viability as well as the native plants and animals who rely on agricultural lands as habitat. We also deeply value our relationships with ranchers, farmers and the many community members who enjoy and appreciate these lands.

Figure 2.2.1 describes OSMP agricultural lands – totaling about 15,000 acres – in terms of their primary operations as of 2018. As we look to the future of agriculture in Boulder Valley, things may look different. The global climate crisis will likely result in less water

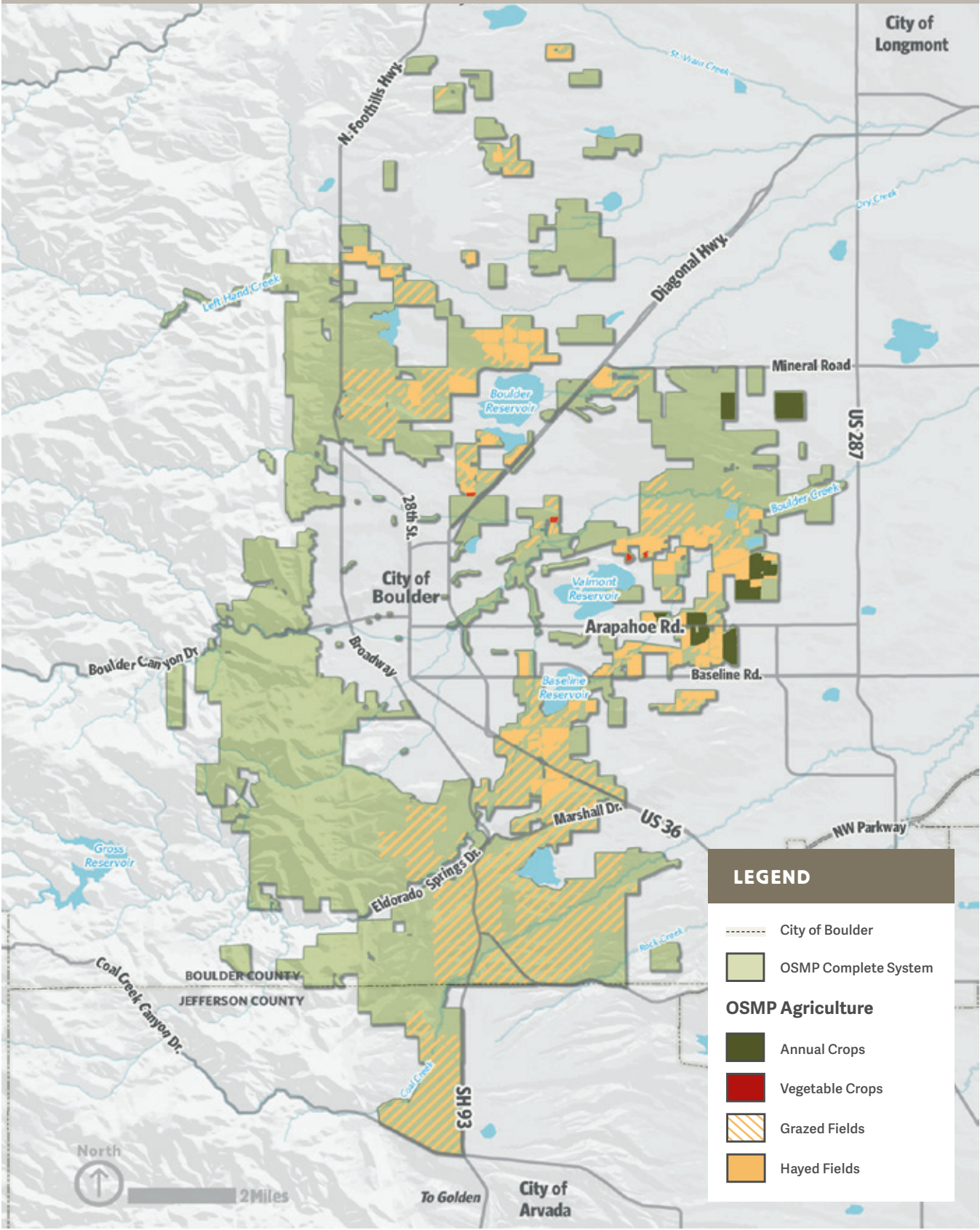
and more pests, as well as uncertainty for cattle ranching as the timing and availability of forage shifts. Soil and wind erosion already challenge our ranchers and farmers, many of whom are nearing retirement.

INTEGRATING PAST
PLANNING

By integrating guidance from our 2017 [Agricultural Resources Management Plan](#) (Ag Plan), we look optimistically to the future of farming and ranching in this focus area – **Agriculture Today and Tomorrow (ATT)**. We set our sights on a viable agricultural economy that supports ecological integration and community connections with open space.

Many of the Master Plan strategies combine management policies from the Ag Plan and others more directly restate them, but all are consistent with the Ag Plan. This focus area also works closely with guidance in the **Ecosystem Health and Resilience** focus area and the [Grassland Ecosystem Management Plan](#). By including this focus area in the OSMP Master Plan, staff now have integrated guidance across all City Charter purposes for open space to help prioritize and coordinate work plans. The Ag Plan will be updated periodically to address changing conditions.

Figure 2.2.1: Operations on OSMP Agricultural Lands (2018 System Overview Report)



OUTCOMES

Agriculture Today and Tomorrow

The following outcomes describe staff and community aspirations for agriculture over the next decade and beyond.

ATT. A) VIABLE AGRICULTURAL LIVELIHOODS	The city's ranchers and farmers are valued and supported in their contributions to the stewardship of Boulder's agricultural heritage.
ATT. B) SUSTAINABLE, PRODUCTIVE AGRICULTURE	OSMP's agricultural lands and infrastructure remain productive and sustainable long into the future.
ATT. C) DIVERSE AGRICULTURAL PRODUCTS FOR LOCAL MARKETS	A diversity of food and agricultural products is grown on suitable open space properties to better meet the changing demands of the local agricultural economy and the needs of ranchers, farmers and city residents.
ATT. D) HIGH-VALUE HABITAT ON RANCHES AND FARMS	City agricultural lands provide high-value habitat for rare and native species, integrating both agricultural and ecosystem objectives.
ATT. E) SOIL HEALTH AND RESILIENCE	Appropriate agricultural practices protect high-quality soils from erosion, improve productivity, maintain soil health and increase resilience in a changing climate.
ATT. F) RESILIENT AND EFFICIENT WATER SUPPLY	OSMP emerges as a leader in the acquisition and preservation of water assets and the application of innovative irrigation practices that anticipate environmental change.
ATT. G) APPRECIATION FOR WORKING LANDSCAPES	Community members experience and better understand working landscapes, contributing to the preservation of Boulder's agricultural lands and heritage.

STRATEGIES

Agriculture Today and Tomorrow

ATT strategies articulate the ways staff will work in partnership with farmers, ranchers, partners and community members towards achieving the desired outcomes for Agriculture Today and Tomorrow. They have been prioritized to support realistic and achievable work plans for staff over the next decade.

THREE TIERS OF PRIORITY STRATEGIES

TIER 1

In the first few years of Master Plan implementation, staff will emphasize the following three high priority ATT strategies through an integrated set of prioritized programs, projects and planning efforts:

- » **ATT.1) Reduce maintenance backlog for agriculture and water infrastructure**
- » **ATT.2) Increase soil health and resilience**
- » **ATT.3) Address conflicts between agriculture and prairie dogs**

TIER 2

Over the next decade, we will also make steady progress towards the following two ATT strategies as funding and staff capacity allow:

- » **ATT.4) Protect water resources in a warmer future**
- » **ATT.5) Encourage diverse and innovative agricultural operations**

TIER 3

Lastly, we will make gradual progress as feasible toward the following four ATT strategies over the next 10 years:

- » **ATT.6) Support the success of ranchers and farmers**
- » **ATT.7) Integrate native ecosystems and agriculture**
- » **ATT.8) Further reduce or eliminate pesticide use**
- » **ATT.9) Enhance enjoyment and protection of working landscapes**

Top: Photo by Steve Slatery

Bottom: Photo by Kristin Weinberger



TIER 1 STRATEGIES

ATT.1) REDUCE MAINTENANCE BACKLOG FOR AGRICULTURE AND WATER INFRASTRUCTURE

Focus investments on maintaining and improving existing agricultural infrastructure to standards—both water-related and structural.

CONTEXT

OSMP supports the livelihoods of the farmers and ranchers who partner with the city to steward the land. These highly specialized partners produce local food, feed and fiber while helping maintain healthy and productive working landscapes and locally valued viewsheds. These same farmers and ranchers play a critical role in conducting routine maintenance on irrigation and agricultural infrastructure while managing open space lands through grazing and haying operations.

As [Chapter 7 in the 2018 System Overview Report](#) describes, agricultural and water infrastructure require ongoing maintenance like all other assets, and currently staff are managing a backlog of needs. The map on the following page indicates the scale and extent of ditches on OSMP lands – only a portion of our full portfolio of agriculture and water infrastructure.

COMMUNITY VOICES

Community engagement revealed that infrastructure and agricultural assets were highly valued, especially when it comes to water. One resident said, “Developing resources are important now because of the uncertain future. We need to plan for this and fix what we have.”

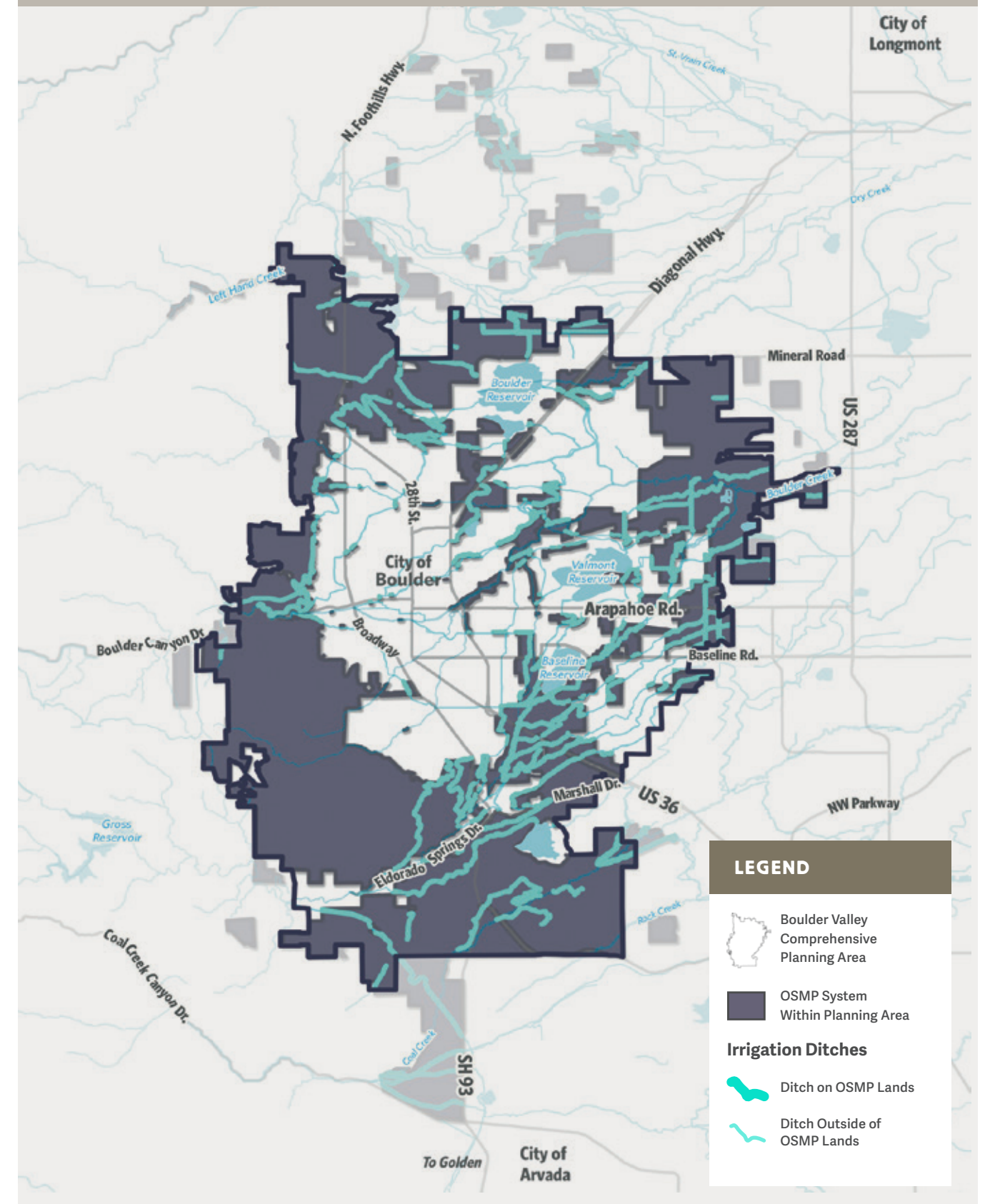
EXAMPLE IMPLEMENTATION ACTIONS

A variety of maintenance projects will help implement this strategy, focusing work on maintaining and improving existing agricultural infrastructure including ditches (**Figure 2.2.2**). In addition, OSMP staff will develop a program to describe the Facility Condition Index for agricultural buildings, irrigation infrastructure and fencing. Afterward, we will seek to develop a maintenance and replacement program to keep much of the infrastructure in good condition.

SUPPORTING GUIDANCE

The [Agricultural Resources Management Plan \(2017\)](#), and the Agricultural Operations target in the [Grassland Ecosystem Management Plan \(2010\)](#) provide guidance and strategies most relevant to the implementation of this strategy. OSMP has also identified the need for the development of water resources management guidance that would also support this strategy.

Figure 2.2.2: OSMP Irrigation Ditches (2018 System Overview Report)



ATT.2) INCREASE SOIL HEALTH AND RESILIENCE

Manage agricultural activities in tilled lands and native grasslands to prevent soil erosion, maintain and/or improve soil health, sequester carbon and protect ecosystem function.

CONTEXT

Maintaining healthy soils is critical for the long-term sustainability of agricultural lands (Ag Plan, 2017). Healthy and productive soils allow farmers to obtain high crop yields with lower expenses and less damage to the environment. Intact soils also stabilize slopes, slow floodwaters and support millions of species of insects, bacteria and fungi.

However, soil and wind erosion are persistent challenges for agricultural operators. For example, a recent assessment of our Bennett property identified significant resource concerns, including sheet and wind erosion, compaction, organic matter depletion and saline crusts. The entirety of the organic matter and topsoil layers have eroded leaving a marginal resource base for future agricultural production. This is shown in **Figure 2.2.3**, where hayfields managed adjacent to the Bennett property (left and right) on private lands appear green and productive, while vegetation on the Bennett property (middle) is simultaneously limited by degraded soils and overgrazed by prairie dogs.

The loss of properties like Bennett from the OSMP agricultural leasing program represents a significant devaluation of the land and water assets that the city acquired. Once in such a degraded state, these lands are difficult to restore. More importantly, soils in this state have diminished capacity to absorb and hold carbon, further contributing to climate impacts and significantly reducing the resilience of these ecosystems to climate change and associated extreme weather events.

COMMUNITY VOICES

The Boulder community has identified climate change mitigation and erosion prevention as benefits of improving soil health (Ag Plan, 2017).

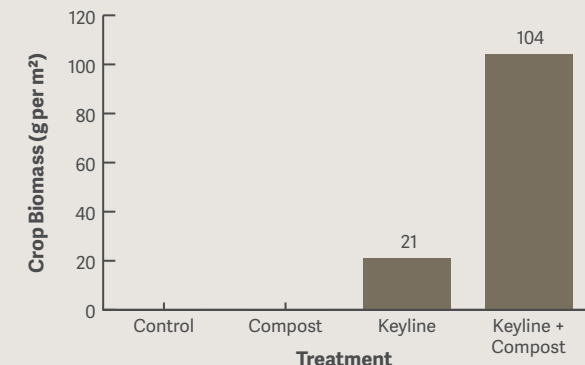
EXAMPLE IMPLEMENTATION ACTIONS

Some promise lies in early research and experimentation on soil regeneration and storing atmospheric carbon in degraded agricultural soils. Initial results from

Figure 2.2.3: Aerial photograph of Bennett Property, May 2018.
Photo by Phil Taylor.



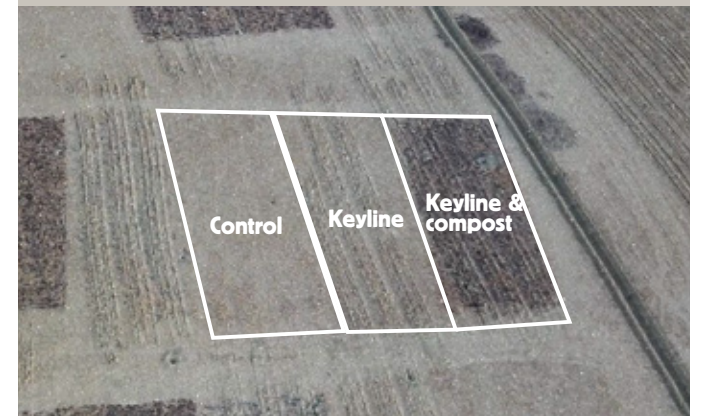
Figure 2.2.4: Effect of Compost and Keyline Plowing on the Success of Cover Crops



piloting this practice – called carbon farming – highlight the importance of an integrated approach to responsible agricultural practices, land restoration, weed management, and grassland health. For example, **Figures 2.2.4** and **2.2.5** demonstrate how compost application, combined with keyline plowing (a subsoil plowing technique), could be used as management intervention to increase soil health in degraded agricultural fields. The increased biomass that results – from more successful cover crops – in turn sequesters more carbon in agricultural soils. Thus, by studying and encouraging regenerative practices on farms and ranches, OSMP is developing and integrating ways to respond to the climate crisis.

In the Boulder Valley, agricultural lands represent one of the biggest opportunities for accelerating carbon sequestration using innovative farming practices to build organic soil matter, like compost application. In studying and encouraging regenerative practices on farms and ranches, OSMP is developing new programs and integrating ways to respond to the climate crisis. For example, this strategy involves developing a soil health program using national best practices such as cover cropping and crop rotation to maintain soil health. Supportive monitoring efforts will track soil organic

Figure 2.2.5: Visual of the Impact of Treatment on the Success of Cover Crops and Crop Biomass



matter and soil health over time and help us ensure the sustainability of agricultural land.

Based on the success of 2018 carbon sequestration pilots, OSMP staff will also enhance demonstration projects and test sites to further understand these practices through research collaborations with the United States Department of Agriculture's Agricultural Research Service, University of Colorado's Sustainability Innovation Lab and others. These results will inform restoration projects throughout the OSMP system and accelerate the development and deployment of successful soil regeneration and sequestration practices to both public and private land managers. Section 3 of the Master Plan illustrates how this work will be scaled to match available funding.

This strategy also has important interrelationships with strategies throughout the Master Plan and within this focus area, including **ATT.3**, **ATT.6** and **ATT.7**.

SUPPORTING GUIDANCE

The [Agricultural Resources Management Plan \(2017\)](#), and the [Grassland Ecosystem Management Plan \(2010\)](#)—especially the Agricultural Operations target— provide guidance and strategies most relevant to the implementation of this strategy.

ATT.3) ADDRESS CONFLICTS BETWEEN AGRICULTURE AND PRAIRIE DOGS

Maintain the viability of agricultural operations by reducing impacts from prairie dogs on irrigated lands, while supporting ecologically sustainable prairie dog populations across the larger landscape.

CONTEXT
Prairie dogs are often considered “keystone” species, providing prey and landscape structure while supporting a healthy native plant community in some sites. However, in highly fragmented areas where prairie dogs cannot move or migrate naturally and where some of their natural predators may be absent, population densities of prairie dog colonies increase, which can negatively impact grassland health and agricultural productivity through extended periods of unusually high grazing pressure from the prairie dogs (Ag Plan, 2017).

COMMUNITY VOICES
In the 2019 OSMP Master Plan Survey, 52 percent of respondents either strongly supported or supported the use of lethal control to remove prairie dog colonies from areas on or near irrigated farmland, when other management tools had not been successful. **Table 2.2.1** below shows a summary of all responses to this question.



EXAMPLE IMPLEMENTATION ACTIONS
Pursuant to City Council direction in 2019, OSMP will evaluate possible lethal and other measures to control prairie dogs on certain irrigated OSMP lands.

Another way to reduce local impacts to farmland is to develop an agriculturally viable cropping program that naturally discourages prairie dogs. These cropping systems could include food forests, polyculture orchards, and tall and fast growing annual and perennial diverse cover crop mixes. Another approach that would address local impacts would be to develop and implement a rapid response restoration and re-colonization prevention program to reduce the presence of prairie dogs on irrigated agricultural lands.

Above: Photo by Brian Peck

Table 2.2.1: Support or opposition for lethal control of prairie dog populations on or near irrigated farmland when other management approaches have been unsuccessful (2019 OSMP Master Plan Survey)

When other management approaches have been unsuccessful at controlling PRAIRIE DOG POPULATIONS ON OR NEAR IRRIGATED FARMLAND, how much would you support or oppose lethal control to remove prairie dog colonies from these areas?	Percent	Number
Strongly support	19%	N=251
Support	33%	N=432
Oppose	19%	N=249
Strongly oppose	17%	N=228
No opinion/Don't know	11%	N=146
Total	100%	N=1306

This strategy also involves exploring projects that can consider changes to prescriptive grazing, vegetation restoration and non-native vegetation management to encourage faster recovery of vegetation in potential prairie dog relocation and agricultural restoration sites. It also involves clarifying how planning efforts can inform updates to policies and regulations applying to irrigated agricultural lands. For example, implementing this strategy would involve updates to sections of the Grassland Ecosystem Management Plan, as guided by **EHR.2) Update and continue implementing system plans guiding ecosystem management.**

SUPPORTING GUIDANCE
The [Grassland Ecosystem Management Plan \(2010\)](#) and [Agricultural Resources Management Plan \(2017\)](#) contain OSMP’s current management objectives and strategies for the conservation of prairie dogs and agricultural operations. Management of prairie dogs is guided by the [city’s wildlife protection ordinance](#), and [Urban Wildlife Management Plan](#).

TIER 2 STRATEGIES

ATT.4) PROTECT WATER RESOURCES IN A WARMER FUTURE

Develop and implement a water resources management plan that balances sustainable agriculture, ecosystem stewardship, protection of water rights, efficiency of water use and resilience in a more variable climate.

CONTEXT

OSMP owns water rights in more than 50 separate water entities with full ownership of seven irrigation ditches and multiple reservoirs. Under the “use it or lose it” principle of Colorado water doctrine, water must be used in particular ways to preserve water rights. Some of these ways, called “beneficial” uses, include agricultural irrigation, stock-watering and instream flows among others. Our staff participate as shareholders and board members of multiple ditch companies, and our water shares are distributed to more than 25 farmers and ranchers through our agricultural leasing program. These farmers and ranchers play a critical role in using water rights across our landscape to ensure we retain them.

They are also critical partners in conducting routine maintenance on irrigation infrastructure (System Overview, 2018; Ag Plan, 2017). With a portfolio of \$60-\$70 million* in water rights plus extensive infrastructure like ditches and farm buildings, we welcome this mutually beneficial partnership.

*OSMP is in the process of updating this figure to better understand the true value.

The global climate crisis, however, is of primary importance when we look to the future of water in our already arid region. Warmer temperatures will likely mean less water is available, even if precipitation levels were to remain the same. A more arid future will compound maintenance and management issues for agriculture and water infrastructure (see **ATT.1**).

COMMUNITY VOICES

In the 2019 OSMP Master Plan Survey, 85 percent of respondents found preserving water rights for native ecosystems and local agriculture important to some degree when thinking about acquiring and protecting land and resources.

EXAMPLE IMPLEMENTATION ACTIONS

OSMP will implement this strategy by completing a full analysis of OSMP’s portfolio of water rights and incorporating it into OSMP’s asset management system. This information will inform future planning efforts for our water in a way that balances resiliency and efficiency. The strategy also guides the development and implementation of a water resources management plan to make sure OSMP water rights are being used for their highest benefit.

SUPPORTING GUIDANCE

The [Agricultural Resources Management Plan \(2017\)](#) provides the greatest guidance specific to OSMP lands regarding this strategy. The city’s [Climate Commitment \(2017\)](#) and the [Boulder Valley Comprehensive Plan \(2017\)](#) provide broader context and direction.

Right: OSMP image



ATT.5) ENCOURAGE DIVERSE AND INNOVATIVE AGRICULTURAL OPERATIONS

Partner with open space ranchers and farmers to analyze and where appropriate expand the variety of agricultural operations on OSMP lands, focusing on the infrastructure and technical assistance needed to support local food systems, including diversified vegetable farming, pastured livestock, micro dairies and taking products to market.

CONTEXT

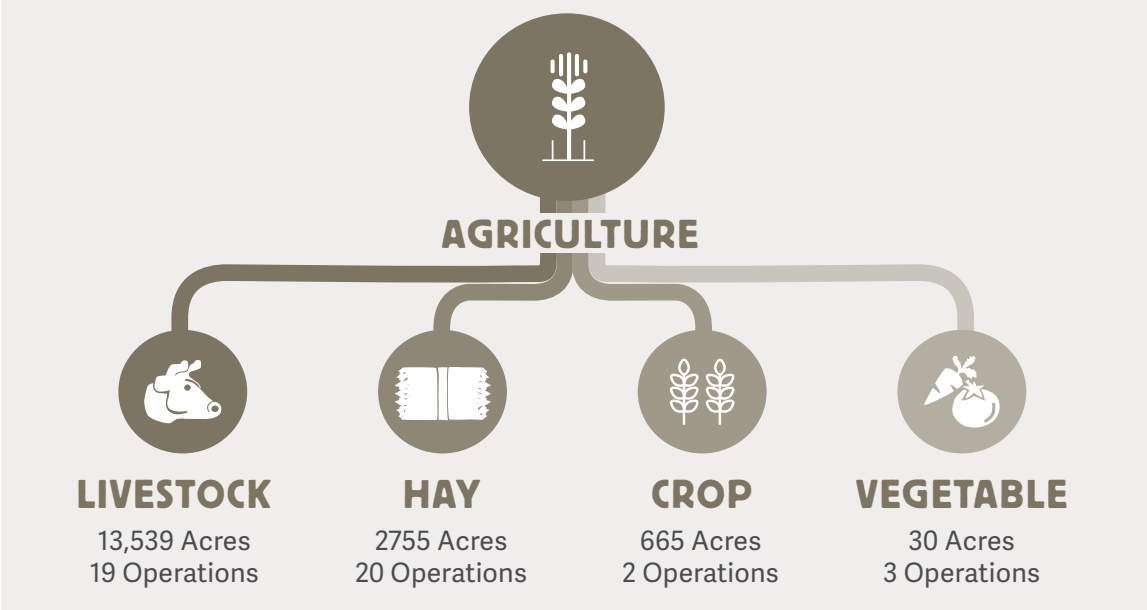
The majority (90%) of agricultural use on OSMP lands is prescriptive livestock grazing, which supports native (unplowed) and natural (historically plowed or overgrazed and restored) grasslands and the wildlife habitats these grasslands provide. Early attempts at plowing native grasslands and cultivating row and grain crops often failed due to lack of water, rocky and limited organic horizon soils, steep slopes, aridity and existing vegetation. The Dust Bowl of the 1930s and the severe drought of the 1950s provide evidence of why growing crops in this semi-arid environment is difficult without adequate water. They also illustrate impacts to native grassland ecosystems that can result from outdated methods of crop farming.

While **Figure 2.2.6** illustrates the predominance of livestock grazing on OSMP lands today, it also describes a diverse and interrelated portfolio of contemporary agricultural practices. For example, OSMP farmers currently grow diversified vegetables on 30 acres of land, and staff have identified an additional 250 acres suitable for accommodating more.

Not all agricultural products grown or raised on OSMP lands are bought and sold locally. This strategy guides staff to consider ways of encouraging the local agricultural economy. As of 2019, across all agricultural operations described in **Figure 2.2.6**, we have 470 acres of agricultural land dedicated to community farming and the production of local food products, which include vegetable, meat and dairy for local sale. Some local food operations on OSMP lands include:

- » Raising approximately 35-40 head of cattle a year which are direct-marketed locally within Boulder County;
- » An organic vegetable farm which sells to local consumers;
- » A sheep and vegetable farm which markets its meat and vegetables through two restaurants, shares in a community supported agriculture (CSA) cooperative, local grocery stores, and the Boulder and Longmont Farmers' Markets; and
- » A farm that supports 320 CSA members and hopes to grow to support up to 450 CSA members.

Figure 2.2.6: Diagram Indicating Types of Agricultural Lands



Further diversifying the variety of agricultural products improves Boulder's food system resiliency. The Boulder community continues to value locally grown foods at Boulder markets and restaurants (System Overview, 2018; Ag Plan, 2017; Agricultural Program, 2019). Available labor, infrastructure costs, and other components of a complete local food system are important issues staff are working to address.

COMMUNITY VOICES

Increasing understanding and appreciation of local agriculture by providing information about locally grown products was ranked highly in the Agriculture Today and Tomorrow questionnaire for how the city should focus on agriculture over the next 10 years.

EXAMPLE IMPLEMENTATION ACTIONS

In coordination with **ATT.6) Support the success of ranchers and farmers**, implementing this strategy will lead to programs that expand and diversify operations, such as an agricultural infrastructure enhancement program that would underwrite the development of diversified vegetable farming, pastured livestock and micro dairies. Other efforts may include developing an agricultural equipment and service library for sharing high capital cost needs across a range of producers or grant writing support to help ranchers and farmers find alternative revenue sources.

SUPPORTING GUIDANCE

The [Agricultural Resources Management Plan \(2017\)](#) and [Grassland Ecosystem Management Plan \(2010\)](#) provide the primary guidance including objectives and strategies related to this strategy.

TIER 3 STRATEGIES

ATT.6) SUPPORT THE SUCCESS OF RANCHERS AND FARMERS

Where appropriate, evaluate and pilot cost-sharing, partnerships and other mechanisms to encourage both responsible land stewardship and economic viability for a diverse range of current and future farmers and ranchers on OSMP lands.

Other challenges that impede the success of our farmers and ranchers include:

- » the high cost of farming in the Boulder Valley;
- » the lack of affordable housing for farm labor;
- » wind and soil erosion (**ATT.2**); and
- » conflicts with prairie dog colonies on irrigated OSMP lands (**ATT.3**).

CONTEXT

Agricultural practices in Boulder have emerged from the experience of local ranchers and farmers over generations. The resulting agricultural systems and food they produce for our tables exemplify a unique agricultural heritage that is valued in the community. Today, we lease about one-third of our system to farmers and ranchers, many of whom have been working these lands for more than 30 years.

These long-term partnerships, which are beneficial to both the city and lessees, support the local agricultural heritage of Boulder Valley and provide for continuous stewardship of the working landscape. As farmers and ranchers age, there is concern about the transition from one generation of ranchers and farmers to the next, and the viability or potential loss of this heritage and institutional knowledge about working OSMP lands (System Overview, 2018).

COMMUNITY VOICES

Community input echoed the idea that OSMP should continue to expand partnerships with ranchers and farmers. One comment at a community workshop was, “Encourage more collaboration between OSMP and farmers, and between regional farmers.”

EXAMPLE IMPLEMENTATION ACTIONS

To help with this generational transition, OSMP staff will support our ranchers and farmers by encouraging the next generation of farmworkers. This work may include advertising lease opportunities more broadly, developing an agricultural scholarship or mentorship program, and collaboration with schools, farm bureaus and other organizations. We will also explore the feasibility of developing a partnerships program to provide affordable housing for farmworkers.

SUPPORTING GUIDANCE

The [Agricultural Resources Management Plan \(2017\)](#) and the parts of the [Grassland Ecosystem Management Plan \(2010\)](#) dealing with Agricultural Operations provide OSMP guidance most related to this strategy.

Left: Photo by Dave Sutherland

ATT.7) INTEGRATE NATIVE ECOSYSTEMS AND AGRICULTURE

While maintaining the viability of agricultural operations, evaluate and increase the potential for improving the quality of habitat on agricultural lands through staff-led programs and partnerships with ranchers and farmers.

CONTEXT

A focus of OSMP's agricultural management approach is the integration of agriculture with ecological stewardship, which aligns with the Ecosystem Health and Resilience focus area. OSMP uses and encourages agricultural management practices that benefit ecological conditions and restore ecosystems. For example, OSMP's network of ditches creates habitat for sensitive and threatened species like the Preble's meadow jumping mouse (Ag Plan, 2017). We also partner with ranchers and farmers to conserve important habitat for native plants and animals, some of which are rare or threatened.

COMMUNITY VOICES

When asked on an online questionnaire about their preferences regarding approaches to preserving agricultural heritage, members of the public prioritized "maintaining working agricultural lands that support native plants and wildlife" above all other options (Engagement Window 3 Summary Report, 2019).

EXAMPLE IMPLEMENTATION ACTIONS

To implement this strategy, we will support and maintain working agricultural lands that support native plants and wildlife by developing an agricultural ecology program that will help guide integration of agricultural productivity and ecosystem conservation. This strategy will also guide the establishment of a native plant propagation program, directly integrating agriculture with ecosystem restoration by growing native plants for use in restoration projects. Integrating with **EHR.7) Develop a learning laboratory for conservation**, OSMP staff will also develop a procedure to monitor the overall quality of habitat on agricultural lands over time.

SUPPORTING GUIDANCE

The [Agricultural Resources Management Plan \(2017\)](#) has a section on Ecological Integration that is consistent with direction in the [Grassland Ecosystem Management Plan \(2010\)](#) which provides guidance for this strategy.

ATT.8) FURTHER REDUCE OR ELIMINATE PESTICIDE USE

Reduce or eliminate the use of pesticides wherever possible. When reduction or elimination of pesticides is not possible, use the least toxic and least persistent pesticide that is effective.

CONTEXT

OSMP policy currently focuses on non-chemical pest management, and we have great strides in reducing use of pesticides throughout the system – both on agricultural lands and elsewhere. Our success involves use of an existing review process for chemical treatments (**Figure 2.2.7**). An important factor in finding the least toxic and least persistent pesticide includes assessing the potential impacts of pesticides to natural controls (natural enemies) and pollinators (System Overview, 2018)

COMMUNITY VOICES

In the 2019 OSMP Master Plan Survey, roughly half (51 percent) of respondents opposed integrating the targeted use of synthetic chemical sprays (herbicides) into the broader management approach.

Figure 2.2.7: Diagram Illustrating the Existing Review Process for Chemical Treatments for Pest Management



EXAMPLE IMPLEMENTATION ACTIONS

Further advancing this work would involve creating a cost-sharing program to encourage reduced risk chemicals and elimination of pesticide use. In order to encourage accountability, this strategy will enable us to implement a surface water monitoring program to audit pesticide use on or near city agricultural lands.

SUPPORTING GUIDANCE

The OSMP [Agricultural Resources Management Plan \(2017\)](#) and [Grassland Ecosystem Management Plan \(2010\)](#) provide the planning and policy guidance most related to this strategy.

Left: Photo by Dave Sutherland

ATT.9) ENHANCE ENJOYMENT AND PROTECTION OF WORKING LANDSCAPES

Partner with community members, farmers and ranchers to maintain and enhance the condition of working landscapes, viewsheds and historic structures.

CONTEXT

To better connect urban society and agricultural activities, it is necessary to cultivate an interest and desire to enjoy, participate in, and learn about farming and ranching. To date, we focus on connecting the community with agricultural lands through passive recreation opportunities, providing visitors with the opportunity to travel through working lands while respecting the needs of lessees. There are about 40 miles of multiuse trails through working agricultural landscapes on lands managed by OSMP. The trail system takes visitors through rangeland and hayfields, providing opportunities for horseback riding, biking, dog walking, hiking and running. For more information on this aspect of our trail system, see the [Agricultural Resources Management Plan](#) (Ag Plan).

In general, we encourage public access where there is visitor infrastructure to support passive recreational activities. OSMP has temporarily closed or limited access to agricultural properties only a few times in the last decade due to potential crop damage or visitor safety concerns. For example, hayfields were temporarily closed when off-trail visitation damaged a hay crop before it was harvested.

The recent Ag Plan offers additional strategies for enhancing community connections to working landscapes, such as farm stands, farm events, agritourism and community farming. We also offer education and outreach opportunities and have created service-learning programs that provide volunteer opportunities in collaboration with farmers and ranchers.

COMMUNITY VOICES

Through the Master Plan process, community members have expressed a desire to more fully understand the agricultural past of the area while also preserving views and landscapes. One community member said, “I love scenic agriculture!”

EXAMPLE IMPLEMENTATION ACTIONS

Conducting baseline inventories and condition assessments of agricultural landscapes – as well as the opportunities visitors have to enjoy, better understand and also help protect them – would help us know what we have, so we can prioritize efforts to preserve the most valued historic and scenic character of working landscapes and historic structures for years to come. OSMP staff will implement this strategy by advancing our cultural resources program in coordination with **CCEI.9) Preserve and protect Boulder’s cultural heritage**. These efforts will include identifying and preserving agriculture-related structures, sites, and landscapes that are eligible for recognition at the federal, state or local level. Implementation will also integrate with **ATT.6) Support the success of ranchers and farmers** as staff explore





partnerships to provide affordable housing for OSMP ranchers and farmers, which may include using historic farmhouses for these purposes.

This strategy will also be advanced through future area planning for the eastern part of the OSMP system, in which many agricultural landscapes lie. Through that multidisciplinary process, we will explore opportunities to improve the condition of working landscapes – as well as the ways visitors enjoy them – by exploring on-the-ground ways to implement the Ag Plan as well as the following interrelated Master Plan strategies:

- » **EHR.4) Reduce undesigned trails,**
- » **EHR.5) Extend on-trail requirements,**

- » **RRSE.3) Update guidelines and standards for quality trail design and construction,**
- » **RRSE.7) Build new trails as guided by past and future plans,**
- » **CCEI.6) Inspire environmental literacy and new involvement in OSMP, and**
- » **CCEI.8) Heighten community understanding of land management efforts, among others.**

SUPPORTING GUIDANCE

This strategy is most supported by guidance from the [Agricultural Resources Management Plan \(2017\)](#). The [Acquisition Plan \(2013\)](#) also guides acquisition opportunities that would support community services such as local agriculture.

Above: Photo by Ann G. Duncan

Advancing Community-wide Goals

The Master Plan advances community-wide objectives described in the city’s Sustainability and Resilience Framework. For example, outcomes and strategies within the **Agriculture Today and Tomorrow** focus area strongly support and align with the following objectives within this framework:

- » Safe Community;
- » Economically Vital Community; and
- » Responsibly Governed Community.

The Master Plan also integrates and applies community-wide policies in the Boulder Valley Comprehensive Plan (BVCP) to OSMP lands and management practices. Outcomes and strategies for **Agriculture Today and Tomorrow** strongly support and align with BVCP policies, including some examples below:

- » 3.13 Water Conservation
- » 3.27 Water Resource Planning & Acquisition

- » 3.09 Integrated Pest Management
- » 9.03 Sustainable Food Production & Agricultural Practices
- » 9.04 Soil Health & Soil Carbon Sequestration
- » 9.05 Access to Healthy Food

ATT outcomes and strategies may also inform BVCP updates that incorporate OSMP Master Plan policies regarding agricultural infrastructure, increasing the variety of operations and protecting viewsheds and working landscapes, among others .



Left: Photo by Ann G. Duncan

Introduction

OUR HISTORIC ROLE IN THE REGION

In 1910, a report by Frederick Law Olmsted Jr. – the nation’s pre-eminent landscape architect at the time – highlighted the value of Boulder’s natural areas, particularly the Flatirons, for their contribution to the quality of life for the citizens of Boulder:

In the great tract of unspoiled foot-hill scenery lying above and beyond the Chautauqua grounds, Boulder has a priceless possession...as paths and well planned roads are gradually extended through the tract it will become possible for anyone to traverse in the course of two hours’ leisurely walking or driving, as beautiful, wild, and refreshing scenery as any that thousands upon thousands of busy, hard-working Americans spend largely of their money and time to enjoy by traveling thousands of miles from home.

Over a century later, Boulder’s open space system is three times the size of the city of Boulder itself, with over 150 miles of trails providing access to much of the same beautiful scenery.

Our community’s long-term investment in open space has paid dividends for each generation of community members with stunning landscapes, trails, and other facilities for all to enjoy long into the future. From hiking, biking and climbing, to birdwatching, photography and quiet contemplation, OSMP lands offer both accessible and challenging terrain for all abilities.

This focus area – **Responsible Recreation, Stewardship and Enjoyment** – gets to the heart of what nature presenter David Attenborough has said, “No one will protect what they don’t care about; and no one will care about what they have never experienced.”

SECTION 2.3 RESPONSIBLE RECREATION, STEWARDSHIP & ENJOYMENT

We are united by our connection to and enjoyment of nature and our obligation to protect it.

A GROWING INTEREST
IN RECREATION

As the Front Range population grows, so too has the interest in outdoor recreation, reflected by the booming outdoor industry in Colorado. Along with the rise in visitation, OSMP has also seen a growing interest and participation in volunteer opportunities as forms of recreation that focus on stewardship. Nonetheless, rising visitation can stress a system that was not designed with current visitation levels in mind. While maintenance needs grow, increased trail use can also displace certain wildlife from the area, facilitate the movement of weeds and pests, cause erosion, and damage vegetation (System Overview, 2018).

As part of this growth, we must also ensure children feel the awe of nature and understand its significance in our world so they will then protect it in years to come. We must also engage and welcome underserved communities and honor our legacy of designing experiences for all to enjoy. And we must, as a community, protect and preserve OSMP lands for future generations.

The full suite of outcomes and strategies in the Master Plan approaches passive recreation opportunities holistically, describing aspirations and approaches for both ecosystem health and visitor enjoyment amid increasing visits to the system. For example, strategy **EHR.4) Reduce undesignated trails** describes a commitment to reduce the occurrence

of undesignated trails, which are some of the most visible effects of increased use. Strategy **EHR.5) Extend on-trail requirements** helps clarify regulations for visitors and minimizes impacts to sensitive habitat adjacent to trails. Strategy **CCEI.2) Enhance communication with visitors** will increase awareness of the benefits of time spent in nature, enjoyable and suitable activities, as well as how we steward the OSMP system to limit resource impacts.

The sections below describe desired outcomes and strategies specific to **Responsible Recreation, Stewardship and Enjoyment**, with an eye to the ways our actions are all related and interconnected. This guidance aligns with existing OSMP trail plans and other OSMP or citywide plans. It also recommends updating our approach to visitor use management contained in the [2005 OSMP Visitor Master Plan](#). It is important to note that in accordance with strategy **FS.10) Update planning framework**, staff will consult with the Open Space Board of Trustees (OSBT) to update our approach to visitor use and passive recreation planning. For example, we are considering whether an integrated approach to area planning that addresses all City Charter purposes may replace our current approach to Trail Study Area planning.

See chapters 2, 8 and 9 in the [2018 System Overview Report](#) for more information on visitation and connecting people with nature.

OUTCOMES
Responsible Recreation,
Stewardship and Enjoyment

Together, staff and community members have described an ideal future for passive recreation on OSMP lands in the outcomes below.

RRSE.A) DIVERSE RANGE OF RECREATIONAL EXPERIENCES	A fun and diverse range of passive recreational experiences inspire stewardship and contribute to our physical and mental well-being.
RRSE.B) ENJOYABLE, RESPONSIBLE RECREATION	Amid changing visitor use levels and patterns, ecosystem health is sustained, and visitor experiences remain positive.
RRSE.C) WELCOMING, ACCESSIBLE TRAILHEADS	Welcoming trailheads and supporting recreational facilities provide access to and highlight Boulder’s scenic, natural, and cultural landscape.
RRSE.D) GREAT EXPERIENCES FOR ALL	Visitors respect and care for each other and for the land, so all can enjoy themselves for generations to come.
RRSE.E) HIGH-QUALITY TRAIL NETWORK	Visitors can enjoy OSMP lands and reach a range of recreational destinations through a well-maintained, connected network of local and regional trails that is welcoming and accessible to all.

STRATEGIES

Responsible Recreation, Stewardship and Enjoyment

The strategies below describe how staff will work towards achieving the desired outcomes described above for **Responsible Recreation, Stewardship and Enjoyment**. Strategies – organized into three tiers of importance to align with community priorities – will directly inform staff’s work plans over the next decade and provide ways of communicating our progress to the public, OSBT, and City Council.

THREE TIERS OF PRIORITY STRATEGIES

TIER 1

In the initial years of Master Plan implementation, staff will emphasize the following two high priority RRSE strategies through an integrated set of prioritized programs, projects, and planning efforts:

- » **RRSE. 1) Assess and manage increasing visitation; and**
- » **RRSE. 2) Reduce trail maintenance backlog.**

TIER 2

Over the next decade, we will also make steady progress towards the following three RRSE strategies as funding and staff capacity allow:

- » **RRSE. 3) Update guidelines and standards for quality trail design and construction;**
- » **RRSE. 4) Encourage multimodal access to trailheads; and**
- » **RRSE. 5) Manage passive recreation activities requiring an OSMP permit.**

TIER 3

Pending resources and funding, we will make gradual progress toward the following four RRSE strategies over the next 10 years:

- » **RRSE. 6) Support a range of passive recreation experiences;**
- » **RRSE. 7) Build new trails as guided by past and future plans;**
- » **RRSE. 8) Provide welcoming and inspiring visitor facilities and services; and**
- » **RRSE. 9) Develop a learning laboratory approach to recreation.**

Top Left: Photo by Phillip Yates

Bottom Left: Photo by Phillip Yates

TIER 1 STRATEGIES

RRSE.1) ASSESS AND MANAGE INCREASING VISITATION

Continue implementing measures from approved plans to mitigate impacts of increasing visitation in specific locations, while also updating the systemwide visitor use management plan to generate and implement ideas for understanding and addressing visitation growth throughout the system and to nurture stewardship and enjoyable visitor experiences.

CONTEXT

As described in [Chapter 2 of the System Overview Report](#), OSMP lands supported roughly 6.25 million visits in 2017, up 34 percent from 4.7 million in 2005 (Figure 2.3.1).

Current estimates indicate city residents account for roughly 60 to 80 percent of all visits systemwide, with variation between places that are locally known versus more iconic places. For example, trails in the northern part of the system are predominantly visited by residents, while places like Chautauqua tend to attract more visitors from outside the city, county, and state (2016-2017 OSMP Visitation Study).

Across the Front Range, land management agencies are experiencing and addressing similar rates of growth. For example, the average annual increase in OSMP visitation is consistent with increased visits to neighboring public lands in Jefferson County and other Front Range areas (System Overview, 2018). Strong regional partnerships with OSMP, Boulder County, Jefferson County, Larimer County, and Colorado Parks and Wildlife have formed to address related concerns in a coordinated way. One such effort is the recently formed NoCo Places 2050, to develop a unified visitor use management approach for nearby local, state, and federal public lands to address visitation growth over the next 30 years.

Figure 2.3.1: Increasing OSMP Visitation Over Time

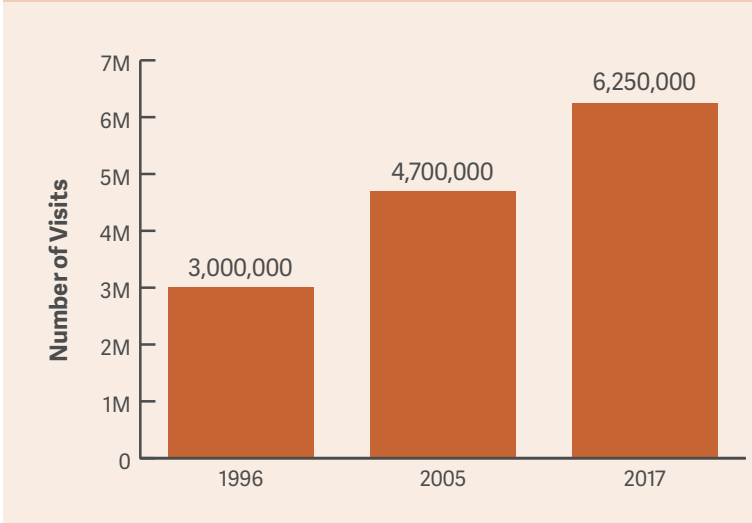
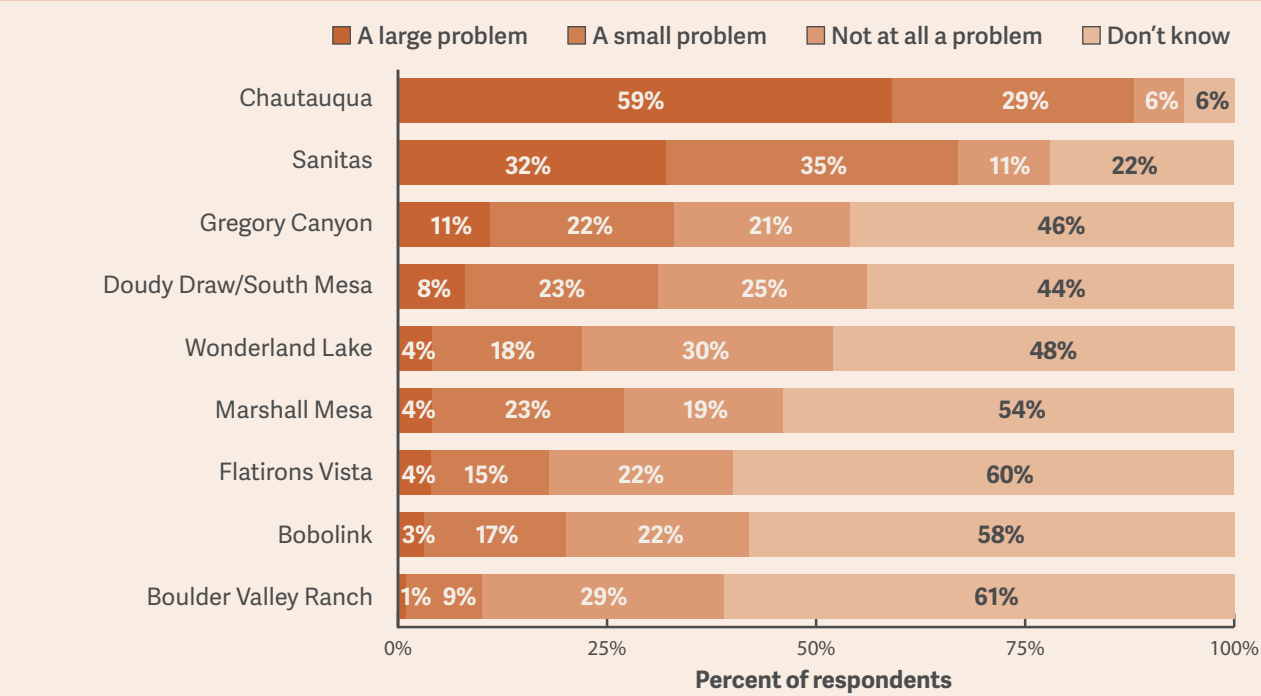


Figure 2.3.2: Residents’ Perceptions of Crowding on or near Trails (2019 OSMP Master Plan Survey)

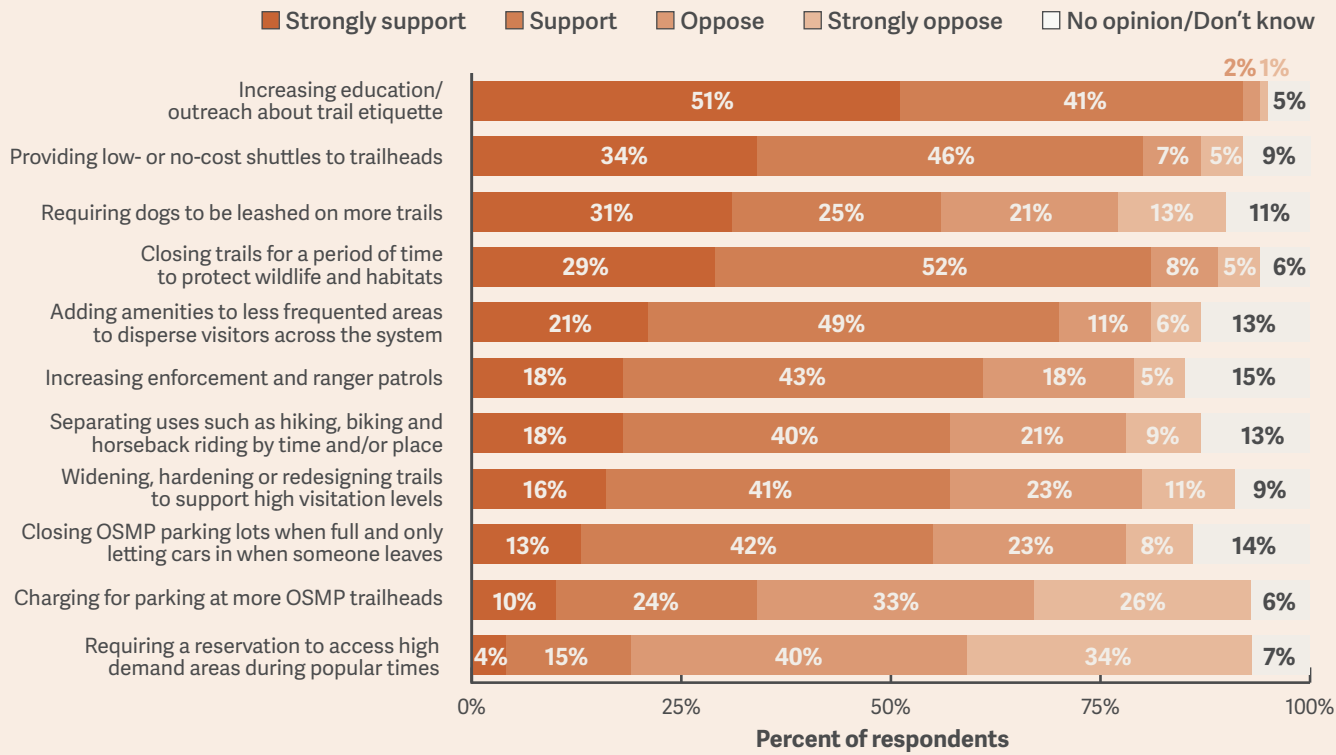


For OSMP, the steady rise in use results in added wear and tear on an aging system of trails and amenities and affect some visitors’ ability to have the experiences they seek on open space. The 2019 OSMP Master Plan Survey suggests that increasing use is affecting visitors’ experiences in certain locations (see Figure 2.3.2). For example, of the roughly 1,200 respondents to this question, most thought crowding on or near trails is a problem at Chautauqua (88 percent) and Sanitas (67 percent). For other sites like Marshall Mesa (27 percent) or Boulder Valley Ranch (11 percent), fewer respondents felt it is a problem. In fact, for most sites, 40 to 60 percent of respondents did not offer an opinion. These findings suggest the need to develop planning tools that provide site-specific, coordinated solutions over time, especially where congestion issues may emerge in the future.

TAKE-AWAY

Increasing visitation – from residents and visitors alike – affects areas across the OSMP system differently, requiring both systemwide and site-specific management approaches. Existing policy guidance offers a roadmap for some immediate actions (see Section 4). Ultimately, a systemwide update to the 2005 Visitor Master Plan (VMP) will be needed through an updated visitor use management plan. This will lead to the development of various approaches that can be deployed across the system informing site-specific needs on visitation issues and opportunities through pilot projects, new long-term policy guidance, and adaptive management.

Figure 2.3.3: Resident Support or Opposition to Potential Management Approaches in High-Use Areas (2019 OSMP Master Plan Survey)



COMMUNITY VOICES

The 2019 OSMP Master Plan Survey sought to understand residents’ level of support or opposition to a suite of potential management approaches to handling high use in certain areas. To address these site-specific concerns, respondents showed some support for steering visitors away from high-use areas by creating amenities that attract people elsewhere. However, most said that they themselves would rather access open space as they do now – rather than making different individual choices to reduce conflict.

As **Figure 2.3.3** shows, over 60 percent of respondents also support the following management approaches for high-use areas:

- » Increasing education/outreach about trail etiquette (92 percent);

- » Closing trails for a period of time to protect wildlife and habitats (81 percent);
- » Providing low- or no-cost shuttles to trailheads (80 percent);
- » Adding amenities to less frequented areas to disperse visitors across the system (70 percent); and
- » Increasing enforcement and ranger patrols (61 percent)

More respondents opposed more restrictive approaches such as charging for parking at more OSMP trailheads or requiring a reservation system to access high demand locations during popular times.



Above: Photo by Ann G. Duncan

EXAMPLE IMPLEMENTATION ACTIONS

PROGRAMS

Guided by approved plans such as the 2005 Visitor Master Plan (VMP) and subsequent Trail Study Area (TSA) plans, staff have successful, interdisciplinary programs in place to manage increasing visitation. Many of these are designed and managed to encourage enjoyable visitor experiences and mitigate conflicts amid increasing visitation. These efforts will remain critical and include:

- » Volunteer opportunities such as the Boulder Mountain Bike Patrol and Volunteer Trail Guides (see **CCEI.7**);
- » Parking fees at certain OSMP trailheads;
- » Chautauqua’s parking management and transportation program (see **RRSE.4**);
- » Directing certain uses (e.g. horseback riding or mountain biking) to certain trails; and
- » Allowing certain uses like hiking or mountain biking only on certain days of the week. In the North TSA, there is guidance to implement temporal separation for the Mahogany Loop Trail.

The Master Plan also guides staff to continue and enhance existing programs that minimize natural resource impacts from visitation, such as:

- » Environmental education, including Leave No Trace principles (see **CCEI.6**);
- » Off-trail restrictions in Habitat Conservation Areas (see **EHR.5**);
- » Temporary muddy trail closures;
- » Temporary area closures to protect wildlife habitat and allow for restoration;
- » Dog regulations (see **RRSE.5**);
- » Commercial use permits (see **RRSE.5**); and
- » White Rocks and Jewell Mountain areas closed to the public for general access allowing education program access only.

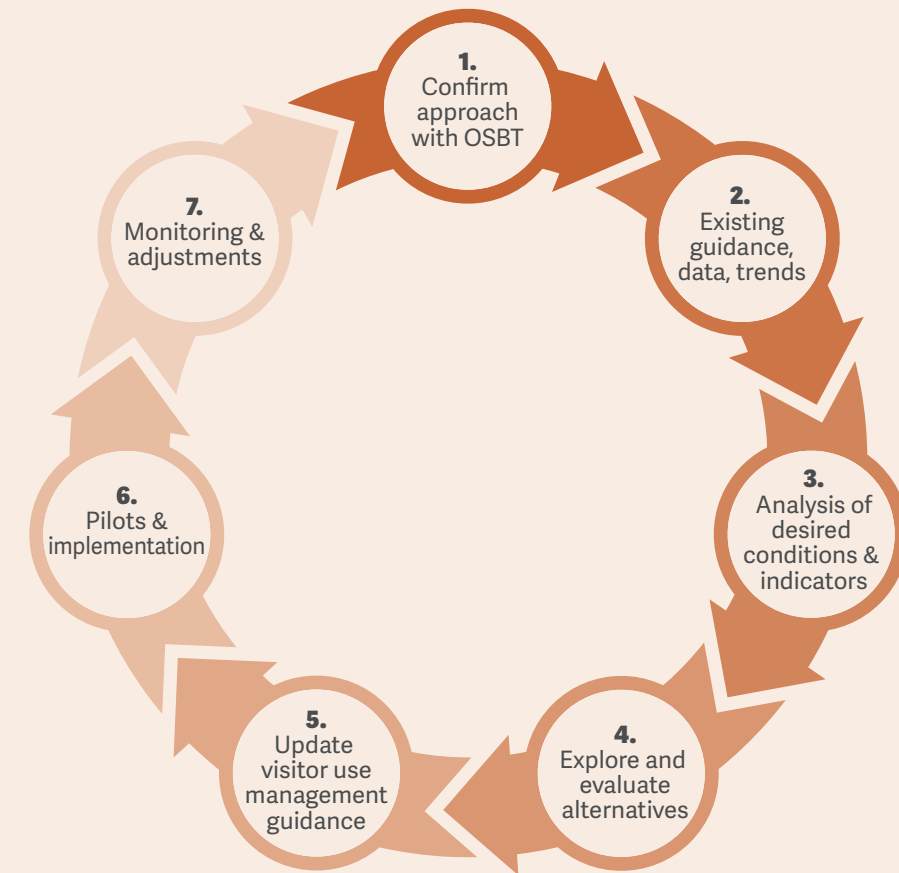
Monitoring and trends data will continue to inform necessary updates to these existing programs. Implementation will be strengthened by integrated program improvements that address multiple focus areas or strategies. For example, high levels of use can also lead to trail widening and braiding when visitors try passing each other (see **RRSE.3**), and perceived parking congestion in some locations (see **RRSE.4**). Also undesignated trails may form when visitors avoid crowded trails or actively seek a different experience (see **EHR.4**). Therefore, other examples of immediate actions can include:

- » increasing the visibility of staff and volunteers out on the land (see **CCEI.1** and **CCEI.2**);
- » targeted patrols by rangers;
- » improving technology to support ranger patrols (see **FS.3**);
- » outreach staff at busy trailheads during the peak hours;
- » real-time visitor information (**CCEI.2**); and
- » expanding volunteer trail guides and volunteer bike patrol programs (**CCEI.6**).

FUTURE PLANNING

Addressing visitation growth also requires thoughtful and holistic management approaches that consider ecosystem health, visitors' experiences, and equity in how all ages, abilities and backgrounds can access OSMP lands. Solutions to address concerns about crowding and overuse will also vary by location. For example, closing parking lots when they are full is only feasible where OSMP trails are supported by OSMP-managed trailheads and when adjacent areas will not be impacted by displaced parking. In some cases, visitors park on public streets owned by the city or Boulder County, which cannot be closed. Therefore, an adaptive, flexible and successful recreation management program will require a planning approach to identify a coordinated spectrum of approaches rather than one single approach.

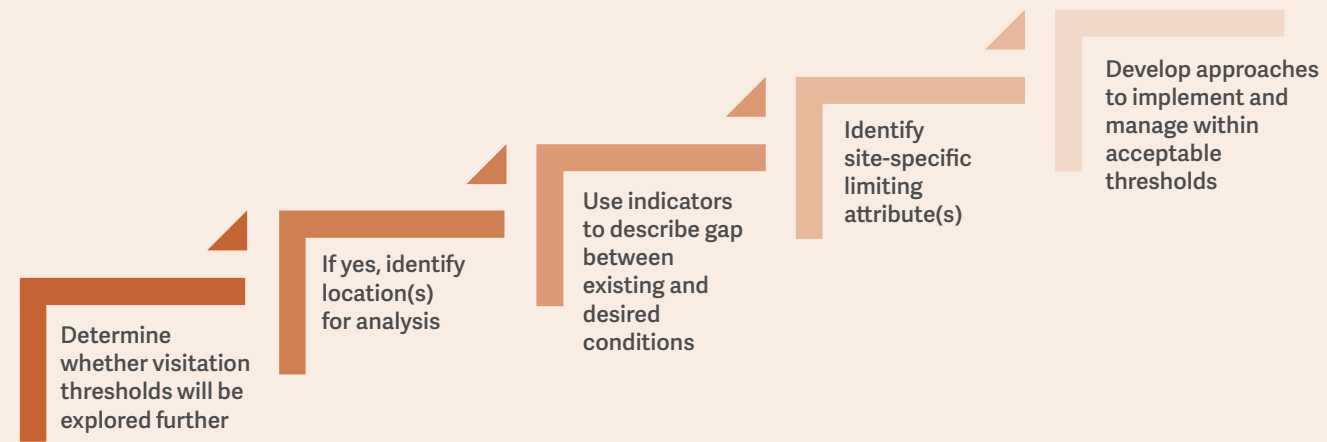
Figure 2.3.4: Future Process to Update Visitor Use Management Plan



To assemble these appropriate solutions, staff will develop a visitor use management plan that incorporates OSMP guidance, data and trends, as well as best practices from land managers across the country. For example, the [Interagency Visitor Use Management Council](#) guides federal land management agencies through a step-wise process to understand and address visitor use. These learnings – drawn from relevant approaches that define limits of acceptable change – will inform this VMP update process, which is illustrated in **Figure 2.3.4**.

For this process, staff will follow citywide guidance related to engagement including the creation of a public engagement plan that clearly defines when community engagement would occur throughout the process. In this example, as part of step 5 above, staff will work with community members, OSBT, City Council, and regional partners to understand which suite of visitor use management approaches OSMP should continue, adjust, add, or discontinue. One potential option includes managing for specific visitor capacities – or “the maximum amounts and types of visitor use an area can accommodate while achieving and maintaining desired resource conditions and visitor experiences that are consistent with the purposes for which an area was established” (Interagency Visitor Use Management Council, 2019).

Figure 2.3.5: Potential Steps for Identifying Visitation Thresholds at Specific Sites, if appropriate



This approach, also called visitation thresholds - is often difficult or infeasible to apply, especially in public lands systems where numerous trailheads and access points limit staff’s ability to manage and control the number of visitors entering the system. It is generally understood that determining whether, how, and where to pilot this approach requires careful and site-specific analysis, engagement, and consideration before pilot efforts are attempted. As public land managers, staff must also consider the degree to which it is feasible to equitably manage any potential numerical limits to visitation.

If the future systemwide visitor use management process was to determine that establishing and limiting visitation thresholds is appropriate for certain OSMP sites, the steps illustrated in **Figure 2.3.5** below would guide those community conversations. These considerations would address potential limiting attributes – or elements of a certain location that constrain the site’s ability to accommodate visitor use. Among other considerations, these limiting attributes could include natural features or cultural resources that are highly vulnerable to damage. They may also

include desired visitor experiences such as solitude or social contact or visitor safety requirements to ensure emergency access is not impeded by high use. These limiting attributes would then inform how visitation thresholds would be defined and managed. An integrated planning approach for visitor use management is described further in **Section 4**.

As described throughout the Master Plan (for example, in **RRSE.4) Encourage multimodal access to trailheads**) successful attempts at addressing concerns about visitation levels often involve a multidisciplinary and collaborative approach. Staff will continue advancing integrated and thoughtful processes to understand, plan, and manage for responsible, enjoyable recreation (see outcome **RRSE.B**).

SUPPORTING GUIDANCE

The [Visitor Master Plan \(VMP\) \(2005\)](#) and the related [Trail Study Area Plans \(2005-2016\)](#) are the current OSMP guidance for managing visitation, with the VMP providing overarching guidance, and Trail Study Area Plans providing site-specific, on-the-ground strategies.

Right: Photo by Jack Sasson



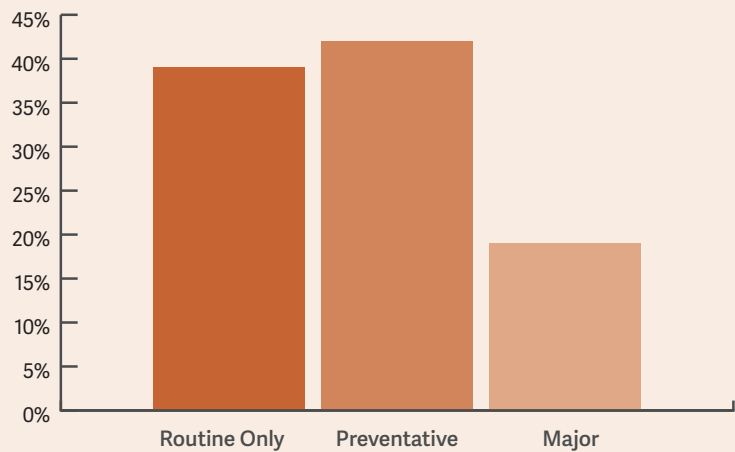
RRSE.2) REDUCE TRAIL MAINTENANCE BACKLOG

Using a prioritized, life-cycle approach to improving the condition of OSMP’s diverse portfolio of historic and modern trails, develop and implement a maintenance approach to fix immediate needs and identify what is needed to manage the trail network long-term.

CONTEXT

To retain good trail conditions, apply best practices and respond to increased threats from the global climate crisis including frequent and intense storms, OSMP will update our comprehensive trail maintenance approach. Additionally, deferred maintenance is a common reality when managing a complex and aging trail system such as the one on OSMP lands. For example, staff have assessed trail conditions across the system according to level of compliance with trail management objectives. While specific management prescriptions have not been developed for all trails, this inventory identified that roughly 20 percent of the assets that make up our trail system need major repair, and 40 percent need preventive maintenance (Figure 2.3.6). This will require long-term investment to address these issues. In a mature system, the goal is to maximize the number of trails in good condition, while taking care of as many of those in poor and fair condition as is feasible.

Figure 2.3.6: OSMP Staff Assessment of Trail Maintenance Needs



Needed improvements and repairs range in length, cost, and complexity. The condition of the trail and associated treatment determines the most appropriate maintenance approach. The major maintenance projects that are in poor condition include reroutes to correct priority issues such as unsustainable grades, ongoing erosion, trail widening, and impacts to surrounding natural habitat. Because these issues are often the result of unsustainable alignments, habitat impacts, or designs that do not meet visitor needs, this strategy relates to **RRSE.3) Update guidelines and standards for quality trail design and construction.**

There are three categories or types of maintenance work that explain the work our staff does to manage designated trails:

- » **Routine maintenance:** All trails, regardless of their condition, require annual routine maintenance to prevent long-term disrepair and the escalating costs that are often associated with preventive or major repairs. This can include brushing or clearing areas, removing fallen or hazard trees/branches, retaining surface drainage, improving tread, etc;
- » **Preventive maintenance:** This type of maintenance is focused on current trail assets to extend their useful life or maintain public use. Examples include repair-in-place upgrades for surface drainage, culverts, trail surfaces, steps, and other trail assets, as well as hazard assessments and proactive removal of safety concerns before they present problems; and
- » **Major maintenance:** This work overhauls or replaces current trail assets back to a good condition. Examples include bridge replacements, trail re-routes, surface drainage improvements, and the addition or significant upgrade of trail structures (steps, retaining walls, puncheons, etc.), as well as retrofits that follow federal accessibility laws, guidelines and standards that are required to keep trails open to the public.

Trail enhancement projects that create a new trail or trail asset are addressed in **RRSE.7) Build new trails as guided by past and future plans.**

While some historic or highly valued trails, such as Flagstaff or Mount Sanitas, offer rewarding experiences, they do not meet typical standards for sustainability and come with higher maintenance costs. Existing Trail Study Area plans for the north, west and southern parts of the system recognize these legacy trails and include approved guidance on rerouting or repairing in-place other trails to increase sustainability, reduce habitat impacts, and improve visitor experience.

TAKE-AWAY

Trails are highly valued by residents and visitors, and the trail network requires a great deal of ongoing work to maintain and improve trail conditions systemwide.

COMMUNITY VOICES

In the 2019 OSMP Master Plan Survey, 76 percent of respondents as shown in Appendix B thought OSMP should focus more on improving maintenance and design of existing trails compared to those who thought we should focus more on building new trails (24 percent). This finding confirms input received throughout the planning process regarding the importance of trail maintenance.

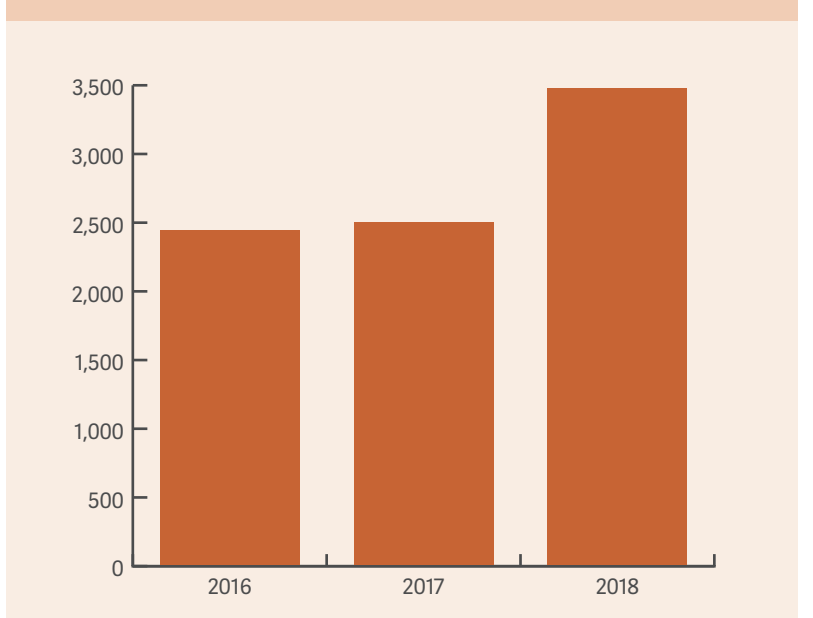


Left: Photo by Phillip Yates

Staff have also begun working on an asset management system to manage data about trail conditions and maintenance over time. As part of this effort, trail maintenance staff will work over the next five years to build off our recent inventory and develop specific prescriptions for fixing the trails. This step in the process will provide more accurate cost estimates and realistic descriptions of what is needed to improve the condition of trail assets. This information can then be tracked over time to inform a phased approach to funding and addressing maintenance needs. This integrated asset management approach for trails and their associated features will improve operations, allowing more efficient allocation of resources (see **FS.3) Understand total cost of system management**). The asset management system will also guide cyclical updates to existing inventories, condition surveys, and estimates for maintenance costs over time.

Program improvements, as guided by this approach, will balance consistent routine maintenance with preventive and major maintenance needs as funding allows. Section 3 of the Master Plan illustrates how this work will be scaled to match available funding levels.

Figure 2.3.7: Trail Volunteer Hours



Through enhanced coordination and partnerships, implementation will integrate with strategy **CCEI.6) Inspire environmental literacy and new involvement in OSMP** to continue to grow the trail volunteer program. Already, between 2016 and 2018, the number of volunteer hours in this program has increased greatly (**Figure 2.3.7**).

SUPPORTING GUIDANCE

The [Visitor Master Plan \(VMP\) \(2005\)](#) – especially the services, policies and strategies of the Trails and Facilities Initiative, as well as the related [Trail Study Area Plans \(2005-2016\)](#) provide the most relevant guidance for this strategy.

EXAMPLE IMPLEMENTATION ACTIONS

Our goal is to ensure the trail system is maintained and managed effectively by tracking progress and experience that can help drive future priorities and innovation. To that end, we are moving toward managing the trail system with an integrated set of tools covering asset management, design

guidelines, construction specifications (**RRSE.3**), and other trail management best practices. For example, design guidelines and construction standards will result in improved quality of visitor experiences, more sustainable trails, as well as less social trailing which means fewer undesigned trails emerging over time.

TIER 2 STRATEGIES

RRSE.3) UPDATE GUIDELINES AND STANDARDS FOR QUALITY TRAIL DESIGN AND CONSTRUCTION

Design and construct quality trails that facilitate a range of experiences through a variety of landscape types, using design guidelines and construction standards that elevate the quality, sustainability, and accessibility of trails and encourage the use of native materials that blend with natural surroundings.

CONTEXT

Trails are often the foundation on which memorable experiences of open space are created for our residents and visitors. Survey results suggest that our legacy of trail building continues to be well-received.

However, we must keep our design and construction practices up-to-date to address changes like those the global climate crisis is bringing. For example, rebuilding trails after the 2013 flood required substantial investment on the part of OSMP. In the future, having updated trail design guidelines and standards in place to improve trail sustainability will increase the ability of trail infrastructure to withstand more frequent and intense flooding. Having updated guidelines will also increase the likelihood of open space receiving more federal aid if we need to rebuild again after significant flooding.

In addition, addressing the following changes will also help us and continue our good work:

- » high levels of use;
- » erosion;
- » current and future connections to the regional trail network; and
- » the proliferation of informal or undesignated trails.

Other important considerations include the ways trails support visitors experiencing disabilities. Currently, OSMP maintains six miles of designated accessible trails, with many other miles enjoyed by people experiencing disabilities. However, no design parameters exist, for example, regarding the width of gates, the design of turning radii, and other trail features that can restrict or facilitate trail use by those requiring the use of wheelchairs or other mobility devices. An OPDMD – or other power-driven mobility device – is defined as “any mobility device powered by batteries, fuel or other engines that is used by individuals with mobility disabilities for the purpose of locomotion, whether or not it was designed primarily for use by individuals with mobility devices” (US Department of Justice, 2014). The consideration of OPDMDs and other needs regarding people with disabilities on public lands is paramount for OSMP’s inclusive future.

COMMUNITY VOICES

In the 2016 Resident Survey, nearly all respondents reported they had used OSMP trails in the previous year, and about 90 percent rated trail quality as very good or excellent. In the 2019 OSMP Master Plan Survey, 57 percent of respondents supported widening, hardening, or redesigning trails to support high visitation levels. Design guidelines and standards will consider these findings and provide general guidance on how and under what conditions to consider these and other trail design techniques that seek to protect adjacent habitat and take visitors where they want to go.

EXAMPLE IMPLEMENTATION ACTIONS

This strategy guides staff to focus OSMP’s design and construction program on updating guidelines and standards, and developing best practices for planning, designing, constructing, and maintaining trails that accommodate a range of passive recreation experiences (see **RRSE.6**). For example, using federal trail standards as a basis for conversation, staff have adapted trail management objectives as one model to document and communicate a classification system for OSMP’s designated trails. Updated design guidelines and construction standards will incorporate this work and address accessibility needs and other appropriate design parameters. They will also incorporate OSMP’s Ecological Best Management Practices.

Design guidelines and construction standards would also provide additional direction on how trails should look and feel in different landscape settings, what range of experiences they should facilitate and what type of destinations they should connect to, such as scenic viewpoints. Guidance would also be updated regarding trail sustainability practices and resilience to more frequent and intense weather events.

SUPPORTING GUIDANCE

The [Visitor Master Plan VMP \(2005\)](#) contains descriptions of services, policies and strategies directly related to this strategy in the Trails and Facilities Initiative. [Trail Study Area Plans \(2005-2016\)](#) have relied increasingly on internal best practices developed by staff in response to the VMP direction.

RRSE.4) ENCOURAGE MULTIMODAL ACCESS TO TRAILHEADS

Explore and partner on a range of coordinated transportation and design solutions to reduce parking congestion, reduce greenhouse gas emissions from visitor travel and promote active living, ecosystem health and public transportation.

CONTEXT

Especially at certain times of the day, week, or year parking at many popular OSMP trailheads can be full, causing spillover parking in surrounding neighborhoods or along highways. Often, residents feel trails are crowded near these same trailheads, such as Chautauqua and Sanitas (2019 OSMP Master Plan Survey), or safety issues occur when vehicles are parked along the shoulders of roads.

Meanwhile, OSMP maintains trailheads that are accessible by bus, as well as a high number of access points that can be reached by bike or on foot by nearby residents. Transportation issues also remain a barrier for nine percent of residents who reported difficulty reaching OSMP by bus, bike, or foot (2019 OSMP Master Plan Survey). Inclusive, equitable, multimodal access to a reasonable cross-section of OSMP trailheads and access points will improve OSMP’s ability to address these needs.

COMMUNITY VOICES

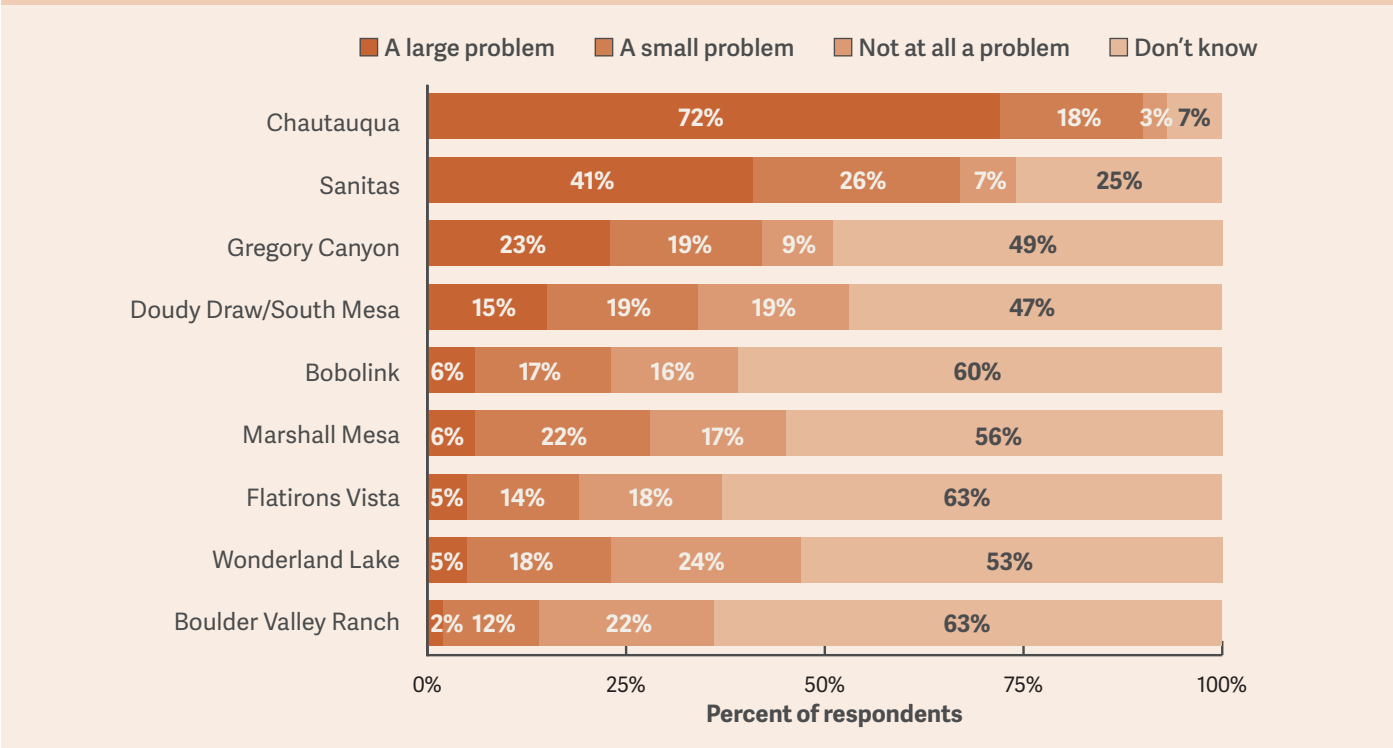
Residents’ perceptions of parking congestion emerged in findings from the 2019 OSMP Master Plan Survey (**Figure 2.3.8**), with clear variations by location. As with perceived crowding on or near trails (see **RRSE.1**), Chautauqua and Sanitas emerged as the places of most concern for perceived parking congestion.

The survey also uncovered support for potential transportation solutions for addressing parking congestion. Overall, respondents support less restrictive approaches over more restrictive ones. For example, most residents (nearly 8 in 10) would support or strongly support the least restrictive approach such as low- or no-cost shuttles to trailheads. Fifty five percent of residents would support or strongly support closing parking lots when full and only letting cars in when someone leaves (more restrictive). Even fewer (roughly 3 in 10) would support or strongly support charging for parking at more trailheads (most restrictive). See **Figure 2.3.3** under **RRSE.1** for more information.

EXAMPLE IMPLEMENTATION ACTIONS

This strategy would enhance program coordination with city and county departments to address parking congestion at trailheads, focused on congestion hot spots, to improve the arrival experience, reduce related neighborhood impacts, and prevent unsafe parking along the shoulders of highways. Approaches may include exploring the feasibility of coupling

Figure 2.3.8: Residents' Perceptions of Parking Congestion (2019 OSMP Master Plan Survey)



shuttle service to trailheads with parking management tools such as time limits and parking fees, as was included in the Chautauqua Access Management Plan. Other means of encouraging walking and biking to trailheads would also be explored, along with connections to the local and regional transportation network to encourage visitors to arrive by bus. Building on successes at Chautauqua, this strategy would inform future planning and design projects to explore short- and long-term solutions to parking congestion where present at high-use trailheads. Incentives for people who voluntarily use alternative modes of transportation would also be considered.

This strategy also supports **EHR. 9) Reduce and offset OSMP greenhouse gas emissions** as well as citywide goals to decrease greenhouse gas emissions and increase biking, walking, and use of public transportation. In addition, this strategy would support and be completed in parallel with strategy **RRSE.1) Assess and manage increasing visitation** to ensure multimodal access options consider implications for visitation numbers.

SUPPORTING GUIDANCE

The [Visitor Master Plan VMP \(2005\)](#) contains a policy similar to this strategy stating that OSMP will provide facilities and services to visitors to encourage their use of alternate transportation modes.

RRSE.5) MANAGE PASSIVE RECREATION ACTIVITIES
REQUIRING AN OSMP PERMIT

Support enjoyable and compatible recreation experiences by periodically evaluating and refining management practices for use permits, off-leash dog visits, and other related regulations to minimize resource impacts and ensure programs are easy-to-understand for visitors, manageable for staff, and responsive to changing conditions.

CONTEXT

Proactive fee-based recreation planning and program management enhances our ability to ensure that people can enjoy specific recreation experiences on our open space lands that require additional administrative support to manage.

For some activities that are consistent with charter purposes for OSMP but have the potential to result in disproportionate impacts to resources or others’ enjoyment, the opportunity to engage in these activities requires adhering to program specifications and paying program registration or permit fees to recover the costs of program administration and oversight. For example, OSMP requires annual, limited, or event commercial use permits for nonprofit and for-profit groups who themselves charge a fee for a service that brings people or animals to OSMP lands or facilities. Requests for participation in fee-based programs are growing and program administration

is becoming more complex, which adds demands to staff time. From 2016 to 2018, the number of commercial use permits issued grew by over 60 percent, bringing in \$34,600 in fee revenue in 2018.

There is also recognition that large groups can gather on OSMP land, and they may not be aware of or in compliance with the current permit system. Ranger patrols are one of the major ways it is possible to manage groups, but with the advance of new technology and the ability for groups to be on the system in any place at any one time, this type of use presents management challenges.

In addition, OSMP is one of the few county or municipal land management agencies along the Front Range that allows dog guardians to walk their dogs off-leash. To enjoy this privilege, dog guardians and their dogs must follow voice and sight control (V & S) requirements, and their dog must visibly display a valid V & S program tag. After attending a V & S education class, dog guardians can register with the program and purchase a tag for each off-leash dog. Staff held 119 programs in 2016, educating 2,300 participants on program regulations.

For the V&S program, requirements and regulations have grown more complex over time, which presents challenges for both visitors trying to understand the rules and rangers trying to enforce them. The table below shows overall compliance rates with V&S program requirements over time as of 2016.

Table 2.3.1: Overall compliance rates for 2006, 2007, 2010, 2014 and 2016 (normalized without unsure responses). (Leslie, 2017)

COMPLIANCE CATEGORY	MONITORING YEAR				
	2006	2007	2010	2014	2016
Noncompliant	34%	45%	41%	34%	32%
Compliant	66%	56%	59%	67%	68%

COMMUNITY VOICES

Currently, about 90 percent of designated OSMP trails allow dogs on-leash. About 60 percent of trails allow off-leash opportunities for Voice and Sight Program participants. According to the 2019 OSMP Master Plan Survey, half of city residents would like more off-leash opportunities to walk their dogs. The other half would like more opportunities to visit areas where dogs are not allowed. Not only were there nearly equal proportions leaning one way or the other, the strength of the sentiment in both directions was also nearly equal as shown in detail in Appendix B. When asked whether they would support or oppose requiring dogs to be leashed on more trails in high-use areas, 56 percent of respondents said they would support it and 34 percent would oppose it.

EXAMPLE IMPLEMENTATION ACTIONS

This strategy will guide staff to periodically evaluate the requirements and regulations related to fee-based programs, as well as other recreation-based programs, in order to continue providing compatible and positive experiences for all visitors while minimizing impacts to natural resources. It will encourage staff to consider, pilot and monitor program enhancements that encourage responsible visitor behaviors.

Forthcoming data on more recent V&S compliance rates will support these community conversations.

Another specific intent for program enhancements is to improve the effectiveness of communicating program expectations, complementing the need to enforce regulations while honoring the diversity of experiences that create unique visits to OSMP lands. Evaluations will focus on fee-based recreation programs such as V & S programs, commercial use permitting, and shelter and facility rentals, but could also include consideration of non-fee programs such as fixed hardware climbing, hang gliding/paragliding, special use event permits (including consideration of group use) as well as others.

SUPPORTING GUIDANCE

The [Visitor Master Plan VMP \(2005\)](#) provides OSMP’s current guidance related to fee-based recreation and commercial uses on OSMP. The VMP established the direction for the Voice and Sight Program which is now carried out in accordance with the [Boulder Revised Code](#) especially [6-1-16](#) and [6-13](#).

TIER 3 STRATEGIES

RRSE.6) SUPPORT A RANGE OF PASSIVE RECREATIONAL EXPERIENCES

Continue to honor a diverse range of passive recreation opportunities that respect the unique character and history of the Boulder community and its surrounding open space lands, providing fun and memorable experiences.

CONTEXT

OSMP lands support a diverse range of recreation activities across a diversity of recreation settings. This concept is rooted in the idea that land stewards can facilitate a continuum of outdoor experiences based on the character of the landscape and by understanding what type of experiences best fit within a particular setting, both temporally and spatially (Visitor Use Management Framework, 2016). By applying this model to OSMP's specific landscape context and management area designations, we aim to better understand and support a range of visitor experiences on OSMP lands. Initial staff work to understand the landscape character of the OSMP system is represented in the [Scenic Resources Chapter of the 2018 System Overview Report](#).

COMMUNITY VOICES

According to the 2019 OSMP Master Plan Survey, the popularity of recreation activities on OSMP lands falls into three groupings. The first – hiking – is enjoyed by 85 percent of adult respondents 18 or older. The second grouping – enjoyed by about 25 percent of adult residents – includes dog walking, running, biking and observing nature/wildlife. The third grouping is enjoyed by less than 10 percent of residents and includes contemplation/meditation (9 percent), climbing/bouldering (8 percent) and photography/painting (6 percent) among others.

Respondents to the 2019 OSMP Master Plan Survey demonstrated differences of opinion regarding opportunities for dogs and bikes. For example, as described under **RRSE.5**, some residents prefer areas where dogs are not allowed (48 percent), while others prefer off-leash dog walking (52 percent). Survey respondents also do not all agree regarding biking. Some would like to see more areas where biking opportunities are improved (59 percent), while others would prefer seeing more areas where bikes are not allowed on certain days (41 percent).

Temporal separation, in general, received mixed results on the same survey. While 55 percent of respondents would support separating uses such as hiking, biking and horseback-riding by time and/or place in high-use areas, only 43 percent said they would be willing to limit their own preferred activities to certain days of the week to reduce the number of activities happening at the same time.

EXAMPLE IMPLEMENTATION ACTIONS

OSMP will continue to provide opportunities for a mix of activities, balancing various community interests. This strategy will continue programming that contributes to the diverse range of passive recreation activities and appropriate behaviors and ethics. For example, the following integrated staff efforts will continue to facilitate a range of opportunities:

- » installing bike-friendly cattle guards;
- » offering bike racks and horse-trailer parking at key trailheads;
- » providing hang-gliding launch points;
- » managing an application program for fixed hardware climbing;
- » offering volunteer opportunities, skill-building programs and environmental education programs; and
- » maintaining a diversity of trail options through a range of landscape types.

This Master Plan strategy also guides future planning and design efforts, in which options for providing and maintaining the following would be considered, among other options: educational loop trails, family-friendly infrastructure, picnic facilities, trails appropriate for mobility devices (see **RRSE.3**), accessibility improvements, stacked loops for mountain biking, climbing areas, connected trail routes for runners, trails through agricultural lands, trailheads with adequate parking, well-designed trails for horseback riding and sites well-suited for bird watching, families with small children or seniors.

Implementing this strategy would also require updating visitor use management guidance in the 2005 Visitor Master Plan to determine the appropriateness of emerging activities such as e-bikes, hammocking, and slack lining on OSMP lands. This planning update would also consider how we improve accessibility systemwide and what programs and projects would improve access for underserved or marginalized populations, including people experiencing disabilities, the Latinx community, and youth.

SUPPORTING GUIDANCE

This strategy is most supported by the [Visitor Master Plan \(2005\)](#). The related [Trail Study Area Plans \(2005-2016\)](#) provide on-the-ground guidance for implementing the objective of maintaining a high quality visitor experience by supporting a diversity of recreational activities.

RRSE.7) BUILD NEW TRAILS AS GUIDED BY PAST AND FUTURE PLANS

Implement past and future plans by constructing new local and regional trail segments where lands offer high recreation potential, especially when opportunities for citywide and regional partnerships leverage OSMP funding.

CONTEXT

OSMP plays a key role in the city and region's open space and trail network. Beyond repair and rehabilitation work needed for existing trails on OSMP land, past Trail Study Area plans have recommended construction of some new OSMP trails. For example, the council-approved North Trail Study Area Plan recommends the design and construction of about 10 new miles of trail. In addition, future area and site planning may also result in recommendations for additional trail mileage.

Staff intend to fulfill goals in past trail plans to design and construct new trail mileage. However, department funding levels over the next decade will determine the degree to which this can be achieved—both in terms of construction and ongoing maintenance costs for new trails. Therefore, additional funding mechanisms may be sought, including management partnerships with other land managers or organizations and volunteers to support trail construction and maintenance.

COMMUNITY VOICES

Input into the Master Plan process at the **Responsible Recreation, Stewardship and Enjoyment** community workshop emphasized improving trail connections, especially local and regional connections for mountain biking and commuting (Third Engagement Window Summary Report, 2019). In addition, 59 percent of residents would like to see trails improved for biking in targeted locations (2019 OSMP Master Plan Survey).

EXAMPLE IMPLEMENTATION ACTIONS

This strategy is in direct support of **RRSE.3) Update guidelines and standards for quality trail design and construction**. It guides staff to pursue design and construction projects for new trails, while emphasizing maintenance needs for existing trails. For example, most of the work identified in the North Trail Study Area Plan for the Boulder Valley Ranch area focuses on repairing or rerouting existing trails, which will improve visitor experience, better protect resources, and decrease maintenance issues and costs over time. A few new trails have also been suggested such as the Shale Trail, and recommendations also included formalizing the undesignated trail along the Eagle and Sage loop. Work plan priorities will focus on repairing or replacing existing trails but then look to expand capacity through partnerships and community volunteers to strategically implement new trail construction.



This strategy also involves regional partnerships to plan, design, construct and maintain regional trail connections. Examples include the Rocky Mountain Greenway, the Colorado Front Range Trail, and the Longmont to Boulder (LOBO) trail.

New trail construction will also be done in close relationship with **EHR.1) Preserve and restore important habitat blocks and corridors**, as well as **EHR.4) Reduce undesignated trails**. For example, staff are currently exploring new trail alignments for the Gunbarrell Hill area, where undesignated trails have fragmented important grassland habitat for Grasshopper Sparrows. Potential solutions are intended to expand habitat

block size for these ground-nesting birds by closing and restoring undesignated trails and improving visitor experiences on more sustainable and enjoyable trail segments.

SUPPORTING GUIDANCE

Both the OSMP [Visitor Master Plan \(2005\)](#) and [Acquisition Plan \(2013\)](#) provide guidance that supports this strategy. The [Trail Study Area Plans \(2005-2016\)](#) identify areas where regional trail connections can be integrated as part of site-specific planning and initial design. The [Boulder Valley Comprehensive Plan BVCP \(2017\)](#) and the [BVCP Trails Map](#) provide broader scale guidance regarding regional trails planning.

Above: Photo by Phillip Yates

RRSE.8) PROVIDE WELCOMING AND INSPIRING VISITOR FACILITIES AND SERVICES

For a range of visitor demographics, continue to provide and improve welcoming, sustainable and accessible trailheads and facilities that lay lightly on the land and inspire understanding of the surrounding landscape, such as the Ranger Cottage, Flagstaff Nature Center, Panorama Point, and other gathering areas or viewpoints.

CONTEXT

In our historic mountain parks just west of town, the National Park Service planned and designed facilities such as Sunrise Amphitheater and Panorama Point in 1937, when Boulder’s population was about 11,000 people (System Overview, 2018). Today, our population is 10 times that, and residents enjoy OSMP lands frequently. In fact, more than seven in 10 city residents report that they visit at least two or three times a month (2019 OSMP Master Plan Survey). This increased use, along with visits from residents of the larger metro area and tourists, puts pressure on aging visitor facilities, some of which need improvements.

The 2005 Visitor Master Plan (VMP) outlined Open Space and Mountain Parks’ framework for making decisions that fosters the continuation of a high quality visitor experience while continuing Boulder’s commitment to protecting and preserving its lands for future generations. It also presented opportunities to create a full range of visitor experiences including extending a sense of welcome, enhancing visitor access, connecting to the land, and accessing various destinations. Today, OSMP continues to advance this model of providing equal opportunities for all residents and visitors to connect with nature “for anyone to traverse,” as Frederick Law Olmsted Jr. described in his 1910 report. As a result, resident surveys conducted by OSMP continue to reflect the public’s overall satisfaction with their open space experiences.

COMMUNITY VOICES

Early in the Master Plan process, the public was asked about their hopes for the future of OSMP. One community member described their hope as, “Quality, well managed, well maintained facilities help preserve the natural environment and enhance recreation.” Another responded, “Because the scenery, the natural resources, and the connection with nature are key elements that Boulder has thoughtfully preserved through open space, visitor facilities are essential for Boulder’s growing population to be able to enjoy these areas.”

Right: OSMP
Image



This desire for quality facilities was also reflected in the 2016 Resident Survey, where respondents rated the quality and importance of certain OSMP facilities. For example, six in 10 respondents felt that restrooms are important. Master Plan engagements with youth, people experiencing disabilities, and the Latinx community also resulted in strong interest and support for accessible, high-quality visitor facilities, including benches, picnic tables, and child-friendly restrooms to support family visits to OSMP (Third Engagement Window Summary Report, 2018).

EXAMPLE IMPLEMENTATION ACTIONS

This strategy directs improvements to our maintenance program for recreation assets by updating facility inventories, better tracking the condition of visitor infrastructure, and anticipating repairs or enhancements. In support of **FS. 3) Understand total cost of system management** and **FS.4) Take care of what we have**, considerations for construction costs and for long-term maintenance needs will also be addressed in future planning and design projects to extend the usable life of visitor facilities and better understand long-term maintenance costs.

By integrating with **RRSE.3) Update guidelines and standards for quality trail design and construction**, this strategy guides staff to work closely with the community, other city departments and other partners to improve design, sustainability, accessibility and maintenance of visitor facilities such as restrooms, picnic areas, bike racks, gathering areas, benches and more. This strategy can also enhance how we deliver services to all residents, for example, through equity and inclusion efforts (**CCEI.1 Welcome diverse backgrounds and abilities**) or interpretive signs in various locations throughout the system (**CCEI.2 Enhance communications with visitors**). The goal is to inspire both awe and understanding of our important natural, scenic, and cultural landscapes by enhancing educational and enjoyable opportunities for all backgrounds and abilities.

SUPPORTING GUIDANCE

The OSMP [Visitor Master Plan VMP \(2005\)](#) contains guidance supporting this strategy as a key goal and guiding principle. [Trail Study Area Plans \(2005-2016\)](#) include strategies and site-specific recommendations related to this strategy.

RRSE.9) DEVELOP A LEARNING LABORATORY APPROACH TO RECREATION

Combine community engagement results with scientific research and comprehensive data analysis to understand trends, develop and assess practical initiatives, and design management approaches that seek to improve community well-being, enjoyment, understanding and stewardship.

CONTEXT

OSMP is committed to inclusive community engagement and continued research and monitoring to better understand how and why visitors enjoy our lands. We also seek practical applications of that data and information to provide the most value for visitors and ecological health alike.

Since 1999, our funded research program has awarded more than \$850,000 for research projects, including many projects aimed at better understanding visitor experience and use of Boulder's open space system. For example, a 2017 study conducted a set of interviews about what makes for a good or bad visit. A set of fifteen indicators of recreation quality were well supported by the data, such as shade, appropriate wayfinding, narrow trails, and absence of ruts, loose rock, and mud (Bruce and Kennedy, 2017).

COMMUNITY VOICES

Over 80 percent of respondents to the 2019 OSMP Master Plan Survey would prefer using the following tools to learn more about OSMP:

- » On-site signs, including links to online content;
- » Website content, including interactive data dashboards and videos; and
- » Graphic materials like handouts, brochures and maps that summarize technical information.

EXAMPLE IMPLEMENTATION ACTIONS

This strategy guides staff to partner with the community to build a common understanding of Boulder's emerging recreation needs and trends, the positive effects open space has on our lives and our community, and the ways this information can inform open space management. It supports all other RRSE strategies by facilitating an inclusive approach to decision-making as it relates to recreation facilities and services. For example, it supports implementation of the city's Engagement Strategic Framework, which seeks to increase government transparency and improve engagement techniques.

This Master Plan strategy also informs our adaptive management approach to recreation. For example, it guides our human dimensions program staff to lead and support a series of projects that can improve the way we design and maintain trails



Left: Photo by Ann G. Duncan

and visitor infrastructure (**RRSE.3**, **RRSE.7** and **RRSE.8**). Data produced would then inform trail and facility design, help staff and others understand how well the community perceives our progress towards improving trail and facility conditions, and lead to potential adjustments in our management approach.

Advancing this strategy would also support the **Community Connection, Education and Inclusion** focus area. For example, by integrating with work under **CCEI.1) Welcome diverse backgrounds and abilities**, our human dimensions program will help guide projects such as focus groups or surveys to better understand and address the needs of underserved populations. In addition, a learning laboratory approach advances **CCEI.2) Enhance communication with visitors** seeks to improve the way we share important information about OSMP with the public through web content, on-site signs, and other graphic materials.

A similar strategy has also been developed in the **Ecosystem Health and Resilience** focus area which will allow better understanding of recreation impacts to natural resources.

SUPPORTING GUIDANCE

Research and monitoring to improve the visitor experience, the sustainability and design of trails and other facilities, as well as the effects of recreation on other OSMP purposes is a theme in the [Visitor Master Plan \(2005\)](#) and the related [Trail Study Area Plans \(2005-2016\)](#).

Advancing Community-wide Goals

The Master Plan advances community-wide objectives described in the city's Sustainability and Resilience Framework. For example, outcomes and strategies within the **Responsible Recreation, Stewardship and Enjoyment** focus area strongly support and align with the following objectives within this framework:

- » Accessible and Connected Community;
- » Healthy and Socially Thriving Community; and
- » Livable Community.

The Master Plan also integrates and applies community-wide policies in the Boulder Valley Comprehensive Plan (BVCP) to OSMP lands and management practices.

Outcomes and strategies within **Responsible Recreation, Stewardship and Enjoyment** strongly support and align with BVCP policies, including:

- » 2.01 Unique Community Identity
- » 2.26 Trail Corridors / Linkages
- » 8.17 Trails Network

Guidance in this focus area will also support community conversations in the future as the BVCP periodically gets updated. For example, **RRSE** outcomes and strategies may inform BVCP updates that incorporate OSMP Master Plan policies regarding trail design, visitor amenities and visitation growth, as well as transportation, mobility and accessibility.



SECTION 2.4

COMMUNITY CONNECTION, EDUCATION AND INCLUSION

Together, we build an inclusive community of stewards
and seek to find our place in open space.

Left: Photo by Phillip Yates

Introduction

MEANINGFUL CONNECTIONS WITH NATURE

Open space allows for more than recreation. Nature can replace the humdrum and stress of everyday life with joy, peace and perspective for those who experience it. During the course of the Master Plan process, OSMP staff asked thousands of Boulder residents and visitors why the city's open space system is important to them. The following responses – and so many other enthusiastic ones like them – led to the creation of this focus area:

“Open space can teach people about their local landscape through a sense of place, can help them learn about science, and their own history.”

“Connecting my children with nature is an important way for me to teach them values about conservation and stewardship of the natural environment.”

“It’s vital for my mental and physical well-being. It’s as simple as that.”

“The more we can connect with nature, the more likely we are to protect nature.”

“Open space was bought to be enjoyed by all.”

MODERN-DAY LIFE

Since 2000, the demographic composition of Boulder has been shifting. The number of city residents of Latinx origin has increased by 8 percent, and more baby boomers are choosing to “age in place,” retiring in their own homes, communities and neighborhoods. Meanwhile, national trends show youth spend less time exploring the outdoors; data and experience indicate that screen time is replacing these connections with nature (Futerra, 2017). At the same time, obesity and mental health issues are on the rise (Frumkin, 2017).

While the benefits of time outdoors include cognitive development, cognitive performance, and improved physical and mental health (Klepeis, 2001), Boulder residents report lack of time as the most common reason they do not visit OSMP more often. Not feeling welcome or safe is another barrier for some (2019 OSMP Master Plan Survey). The future of OSMP depends on our strategic response to these changes. We embrace diversity – as many land managers have around the country – and foster a welcoming, inclusive approach to build community. Greater social mixing, civic participation, and a sense of belonging will emerge, resulting in greater care of the lands we all value so deeply.

CLIMATE LITERACY

The future of Boulder’s human and natural communities is inextricably linked to the emerging climate crisis. While research is still nascent, the implications of climate change for people of all ages, especially youth, will be critical to understand in the coming decade (White, 2011).

Environmental education in the last 50 years has extolled the importance of protecting nature - inducing wonder and awe that leads to understanding and appreciation. These major tenets of environmental literacy need to be retained, yet with the pending climate crisis, we need a new call to action. For the health of our community and planet, we need to think about humanity’s response to the



climate crisis, act, and try to fix the issues that recent generations – including ourselves – have created.

Above: Photo by Rocio De Prado

Now more than ever, we must work side by side with youth in environmental education efforts. As we all take greater responsibility in the coming decade, we will help youth adapt to changing conditions, live with these changes and hopefully begin to find ways to work within and with nature. A growing body of research shows that environmental education is a powerful way to teach and inspire positive environmental behaviors. It inspires action that builds resilience (Ardoin, 2019). The ways each of us choose to care for ourselves, others and the places to which we are connected influence both our environment and our communities (E Movement, 2018).

OUTCOMES
Community Connection,
Education and Inclusion

The following outcomes describe staff and community aspirations for the next decade and beyond.

CCEI. A) INSPIRING ENVIRONMENTAL EDUCATION	Visitors participate in education programs and other forums that deepen their sense of place and appreciation for Boulder’s natural, cultural and scenic heritage and broaden their understanding of OSMP land and its management.
CCEI. B) FULFILLING COMMUNITY INVOLVEMENT	Community volunteerism, partnerships and neighborhood involvement serve an increasingly vital role in OSMP’s fulfillment of the City Charter purposes for open space.
CCEI. C) LIFETIME CONNECTIONS WITH NATURE	Long-term connections with OSMP lands are strengthened and deepened over the course of our lives and across generations, in part to inspire response to the climate crisis.
CCEI. D) PHYSICAL AND MENTAL WELL-BEING	Increase awareness of the benefits of nature and the ways visiting OSMP lands can reduce stress and increase physical and mental well-being.
CCEI. E) ENGAGED YOUTH INSPIRED BY NATURE	OSMP is an emerging leader in promoting an increase in the time that youth spend outdoors and caring for their open space system.
CCEI. F) PROMOTING EQUITY AND INCLUSION	We are all part of an inclusive community, where all people feel welcome, safe and able to enjoy the benefits of open space.
CCEI. G) CONNECTIONS TO BOULDER’S PAST	Cultural landscapes and historic resources on OSMP lands are preserved so that people can enjoy and understand the places and stories of Boulder’s past.

Left: Photo by Phillip Yates

STRATEGIES

Community Connection, Education and Inclusion

In support of the outcomes above, strategies for CCEI describe how staff will foster a forward-thinking conservation ethic while promoting diverse, inclusive engagement for all ages. This work is essential for future protection and enjoyment of our public lands. These strategies have been prioritized to guide reasonable work plans for staff over the next decade.

THREE TIERS OF PRIORITY STRATEGIES

TIER 1

In the first few years of Master Plan implementation, staff will emphasize the following two high priority CCEI strategies through an integrated set of prioritized programs, projects and planning efforts:

- » **CCEI. 1) Welcome diverse backgrounds and abilities**
- » **CCEI. 2) Enhance communication with visitors**

TIER 2

Over the next decade, we will also make steady progress towards the following two CCEI strategies as funding and staff capacity allow:

- » **CCEI. 3) Connect youth to the outdoors**
- » **CCEI. 4) Support citywide engagement with federally recognized American Indian Tribes and indigenous peoples**

TIER 3

Lastly, we will make gradual progress as feasible toward the following five CCEI strategies over the next 10 years:

- » **CCEI. 5) Foster wellness through immersion in the outdoors**
- » **CCEI. 6) Inspire environmental literacy and new involvement in OSMP**
- » **CCEI. 7) Cultivate leaders in stewardship**
- » **CCEI. 8) Heighten community understanding of land management efforts**
- » **CCEI. 9) Preserve and protect Boulder's cultural heritage**

TIER 1 STRATEGIES

CCEI.1) WELCOME DIVERSE BACKGROUNDS AND ABILITIES

Improve understanding, services and facilities for underserved communities through outreach, collaborative partnerships, listening sessions, culturally-relevant programming, language translations, visual signs and materials, staffing and other creative means of empowering and engaging underserved members of our community.

CONTEXT

Among the Latinx community, language is one of the barriers to visiting OSMP. In a report on Master Plan focus group findings, authors described how visitors felt while visiting open space lands: “Not having language access to the written materials in the parks, not being able to understand the information already there, as well as not understanding the “unwritten” cultural rules when one goes to the outdoors” [can be challenging]. Focus group participants also agreed that signs and other graphic materials need to be more prominent and visible. Some expressed fear of being in nature or uncertainty around trail etiquette (Martinez and Abajo, 2018).

For over two decades, OSMP has been working to provide meaningful outdoor programming to people with diverse backgrounds and abilities. In 2018, we participated in many events and provided over 80 Spanish and bilingual programs connecting with nearly 2,500 Spanish speakers. In addition, OSMP offers a few Spanish interviews on local radio stations such as KGNU and La Voz Auditiva de Colorado to share departmental information including opportunities to get involved (Jr. Rangers, volunteering, recreation opportunities, Master Plan, etc.) as well as specific programs about experiencing the land for people with disabilities, OSMP and the Arts and the benefits of being outdoors.

In 2018, staff taught people how to lead wheelchair hikes at both national and international conferences. OSMP’s award-winning videos highlighting accessible trails on OSMP continue to get many hits on our website. In addition, OSMP produces a [guidebook](#) for people experiencing disabilities highlighting accessible trails and amenities throughout the system. This past year we offered 63 programs reaching more than 400 people experiencing disabilities including 38 all-terrain adaptive handcycle rides to inspire people with recent injuries, 10 wheelchair hikes, three hikes for people experiencing disabilities, four hikes for people experiencing memory loss, and a dozen other programs reaching nearly 100 community members including LGBTQIA+, seniors, and people experiencing memory loss.



COMMUNITY VOICES

In the fall of 2018, high school student members of the City of Boulder’s Youth Opportunities Advisory Board (YOAB) engaged over 500 of their peers to explore four of the Master Plan’s focus areas and how they could best be supported by outcomes and strategies. YOAB students then presented their findings to the Open Space Board of Trustees and to members of the public at a Master Plan community workshop. Their resulting recommendations asked OSMP staff to support all groups including youth, young adults, people experiencing disabilities, and low-income families. Potential courses of action included educational programs and hikes in different languages and for different ability levels, programs to slowly increase comfort in open space, improvements to signs, and increased accessibility.

EXAMPLE IMPLEMENTATION ACTIONS

Building on the important work we have done for the past two decades, this strategy will continue to guide future projects such as surveys, focus groups, workshops, programs, or other listening sessions to further understand barriers to visiting open space and ways to make people feel more welcome. An upcoming project starting in 2020 will continue exploring these needs and opportunities further and with a wider range of community members.

Staff will also continue to meet people where they are and welcome them to the open space system through a continuum of experiences. For example, in working with the Latinx community, we learned there are opportunities to better accommodate picnicking for families and increase awareness that open space belongs to all members of the community. Working with

Above: Photo by Phillip Yates

other city departments, Boulder County and other partners, staff will collaborate on providing access and opportunities to connect with a range of open space and park lands for underserved communities. These efforts will ultimately help reduce the consequences of unintended bias in our community as we learn together how to better value, nurture, and leverage diversity and inclusion in land management.

To ensure a range of neighborhoods and demographics have equal opportunities to learn about and engage with open space, this strategy also advances staff's ability to equitably distribute education and recreation programs across the system. This work may also involve enhancing partnerships with community-based organizations to support an OSMP community liaison to work in and with underserved communities. OSMP is currently engaged in community partnership pilot programs with Walk to Connect and Boulder Housing Partners. We have also upgraded infrastructure at certain trailheads over the last decade to increase accessibility in compliance with federal laws, guidelines and standards. Another project entailed the completion of a sensory trail on top of Flagstaff Mountain that was designed to be accessible to all.

For implementation of this strategy, collaboration among our staff, residents and citywide workgroups will be needed. For example, improving restrooms and benches to better accommodate people experiencing disabilities, older adults, babies and families will require an interdisciplinary approach to design. Implementing this strategy also supports other focus area strategies, including **RRSE.6)** Support a range of passive recreation experiences, **RRSE.8) Provide welcoming and inspiring visitor facilities and services**, and **ATT.9) Enhance enjoyment and protection of working landscapes**.

SUPPORTING GUIDANCE

The [Long-Range Management Policies \(1995\)](#) and the [Visitor Master Plan \(2005\)](#) contain guidance for OSMP encouraging accessibility for people experiencing disabilities. Citywide policies also provide important guidance supporting this strategy including the [Boulder Valley Comprehensive Plan \(2017\)](#), the [Sustainability and Resilience Framework](#), especially the Healthy and Socially Thriving objective and the [Engagement Strategic Framework \(2017\)](#).

CCEI.2) ENHANCE COMMUNICATION WITH VISITORS

Foster discovery, enjoyment and stewardship through a coordinated effort to enhance signs, communications and media that incorporate effective design, messaging and languages for a range of audiences as well as increasing ranger and volunteer presence on the system to welcome and inform visitors.

In addition to communications through signs and media, our most important way to welcome and inform visitors is through our rangers who patrol the system, outreach staff at our trailheads and volunteers including our bike patrols and trail guides. As our system has grown and the number of visits to the system increases, it has become harder to ensure we can reach as many visitors as we would like to, keeping them informed about how to Leave No Trace on the land and advised about how they can best enjoy their experience.

CONTEXT

Signs and a range of other interpretive media are used to share important information, tell essential stories about Boulder's natural and cultural history and support learning. Sometimes they also seek to guide or change behaviors by including rules and regulations. Continuous improvement in the development of communications strategies and design, placement, content and development of signs will help visitors find their way, learn about the land, and take care of OSMP.

COMMUNITY VOICES

Results from the 2016 Resident Survey suggest that nine out of 10 residents visiting OSMP areas use directional signs and that eight out of 10 consider them very important or moderately important. This reliance on signs was echoed by community members throughout the OSMP Master Plan process. Some asked for "more signs that teach us" or "signs to expand sense of place and understanding of the land to allow for self-guided tours and information for all." (Engagement Window 3 Summary Report, 2019).

In the 2019 OSMP Master Plan Survey, respondents also ranked on-site signs, including links to online content, highest when asked which tools they are most likely to use to learn more about OSMP.

Below: Photo by Steve Mertz



EXAMPLE IMPLEMENTATION ACTIONS

In support of educational programs and facilities that inspire understanding of the OSMP landscape, one implementation project will involve developing a coordinated, multidisciplinary approach to communicating clear, educational and inspiring messages to our diverse community in a variety of ways. In turn, this will guide and support the provision of print and web-based media, interpretive signs, facilities, exhibits and in-field visitor contacts. For example, staff have identified important themes to guide storytelling and help visitors understand, enjoy and protect nature. Using these themes, future projects will then improve the educational content and quality of interpretive stories throughout the landscape.

This strategy also guides projects to enhance signs and other materials to improve understanding for a broader range of audiences. For example, Spanish translations, universal graphic symbols and other design improvements will inspire more discovery, wonder and feelings of safety and belonging.

Implementation also relates to **EHR.4)**

Reduce undesignated trails. As future decision-making guides on-the-ground changes to address undesignated trails, signs may need to be removed, moved or replaced with new messages. These improvements would help clarify expectations for visitors and ensure successful implementation of that strategy.

In support of **RRSE.1) Assess and manage increasing visitation**, other implementation efforts increase the visibility of staff and volunteers out on the land. This program improvement would involve targeted patrols by rangers, improving technology to support ranger patrols, staffing busy trailheads during peak hours, and expanding volunteer trail guides and volunteer bike patrol programs. Increasing the presence of rangers, outreach staff and volunteers on the system will provide more information about how residents and visitors can enjoy and protect the system.

SUPPORTING GUIDANCE

The [Visitor Master Plan \(2005\)](#) and the related [Trail Study Area Plans \(2005-2016\)](#) provide the most relevant guidance for the implementation of this strategy. The VMP provides guidance for signs and other communications across all seven of the plan's initiatives. TSA plans provide specific information about on-the-ground sign and communication needs.

TIER 2 STRATEGIES

(CEI.3) CONNECT YOUTH TO THE OUTDOORS

Ensure youth get outside more by offering a continuum of educational and service-learning opportunities that fosters youth interest, competence and confidence in enjoying and conserving nature.

CONTEXT

Nature inspires! It stimulates imagination and creativity, builds confidence, and invites children to explore. Research shows that in order for youth to connect to, care about, and therefore become stewards of the land, they need repeated access to it – whether in nearby natural areas like a backyard or a neighborhood park, or on their public lands. These connections then lead to a sense of purpose and confidence in young people's ability to protect nature, especially amid rapid environmental change.

OSMP provides a continuum of programs designed to invite youth and their families onto the open space system, with messages of stewardship, ecology and outdoor opportunities. Programs include a Boulder Valley School District (BVSD) musical school assembly reaching nearly 9,000 students annually, field trip programs, a Wildlife Education program serving 3rd graders, and public programs for families including

Meadow Music, Nature Play, Storybook hikes, Nature for Kids and Families, and more. These programs help youth find joy, gain understanding and build appreciation for plants, animals and the open space landscape.

COMMUNITY VOICES

Many community members identified the role programming and partnerships could play in getting youth outdoors. At a community meeting when one mother was asked about how her children could be more involved with OSMP she said, “[Spanish; English] Que las escuelas hicieran programas de ir una vez y mas a las montañas; Schools should have programs that regularly take students out to the mountains,” and “[Spanish; English] Ofrecen programas para visitantes para que los pequenos reconozcan la naturaleza; Offer visitor programs for small children so they recognize nature” (Engagement Window 3 Summary Report, 2019). Another community member stated that OSMP is important to them because “being outdoors is an important part of my parenting strategy.”

Engagement with the City of Boulder's Youth Opportunities Advisory Board emphasized the importance of youth engagement, as did focus groups with members of the Latinx community who ranked these efforts highly in a prioritization exercise.



EXAMPLE IMPLEMENTATION ACTIONS

Implementation will include a youth survey to establish a baseline and ongoing metrics to understand how much time Boulder youth spend outdoors as compared to national averages. Program improvements would then develop, communicate and implement a continuum of opportunities for youth to connect with nature through environmental education, nature play, stewardship and service-learning experiences.

To further engage youth, OSMP will expand upon the success of the now 54-year-old Junior Ranger program by increasing the number of crews over a 10-year period. Programming would continue to focus on trails, conservation and ranger naturalist skills, while also introducing a focus on agriculture, the climate crisis and other open space topics such as inclusion. Youth will continue to be involved in priority natural resource management projects, teaching them how to make sound environmental decisions in the future. **Section 3** of the Master Plan illustrates how this work will be scaled to match available funding levels.

Above: Photo by Dave Sutherland

The City of Boulder values partnerships as a successful approach to getting more youth outdoors. As such, OSMP collaborates with many agencies including Growing Up Boulder (GUB), Youth Opportunities Advisory Board (YOAB), Youth Services Initiative (YSI), the E-Movement (a community-wide effort to educate Boulder County youth to engage in environmental stewardship) and the Boulder Valley School District (BVSD). OSMP is also working to expand our partnerships with Parks and Recreation and Housing and Human Services. Staff and our partners are setting up a program that would guarantee children and their families get outdoors more, facilitating youth connections with nature through unstructured time in open space.

The pending climate crisis will impact youth and future generations to a greater degree than older generations. People of all ages, including youth, will need to work together to find innovative ways to learn to live within and with nature. Therefore, new environmental literacy programs (see **CCEI.6**) designed for and developed in partnership with youth will highlight the role OSMP lands play in sequestering carbon and addressing

the climate crisis, thereby encouraging young people to begin thinking about their role in fixing challenges associated with rapid environmental change. Community involvement and the collective actions we can take will become increasingly important as the climate warms up.

A staff project will also explore the potential for forming a youth advisory board and additional mentorship opportunities to better connect youth with nature. Our goal is for our community to grow a climate crisis literate youth who can understand and consider current and future challenges.

SUPPORTING GUIDANCE

Prior to the OSMP Master Plan, the [Visitor Master Plan \(2005\)](#) (see the Education and Outreach Initiative) was the OSMP plan providing direction and guidance on connecting people with nature; however, there is no emphasis on youth. Implementation of general policy guidance has established and advanced many successful youth-focused programs like the Junior Rangers/Junior Ranger Naturalists and Meadow Music.

CCEI.4) SUPPORT CITYWIDE ENGAGEMENT WITH FEDERALLY RECOGNIZED AMERICAN INDIAN TRIBES AND INDIGENOUS PEOPLES

Support citywide efforts to work in partnership with federally recognized American Indian Tribes and other city departments through formal government-to-government consultations to support American Indian Tribes and Indigenous Peoples' connections to their ancestral homelands.

CONTEXT

In accordance with the city's interest in improving relationships with tribes and indigenous people, we must work to understand, honor and promote the history and culture of the indigenous people associated with Boulder. This will include opportunities to integrate American Indian Tribes' perspectives into OSMP management practices. We will also work to preserve, appreciate and honor the intangible traditions and cultural resources of those indigenous to the lands of Boulder.

COMMUNITY VOICES

During the Master Plan process, community members encouraged staff to continue engaging with American Indian Tribes and Indigenous Peoples (Engagement Window 3 Summary Report, 2019).

EXAMPLE IMPLEMENTATION ACTIONS

Implementation would require a program to guide formal and regular government-to-government consultations, as well as the ways staff will continue working with the local indigenous community. We will also support local organizations to help the community understand, honor and promote knowledge of American Indian Tribes' historical presence in the Boulder Valley and their forced removal from the area, which in turn will enable visitors to learn from and about American Indian Tribes and Indigenous Peoples. Through consultation, implementation will also include a process for acknowledging and respecting American Indian Tribes' stewardship of Boulder lands at public events and in educational programming.

SUPPORTING GUIDANCE

The primary guidance for this strategy is the [2002 Memorandum of Understanding \(MOU\)](#) signed by the City of Boulder and 13 American Indian Tribes and the [2002 MOU amendment](#) to facilitate communication about cultural resources and to provide opportunities to hold traditional ceremonies requiring temporary structures – such as sweat lodges or tipis – on city-managed lands.

TIER 3 STRATEGIES

(CEI.5) FOSTER WELLNESS THROUGH IMMERSION IN THE OUTDOORS

Working with schools and organizations, raise awareness of how open space improves physical and mental well-being.

CONTEXT

Our City Charter guides OSMP staff to manage the land for its contribution to the quality of life of the community. Compelling research continues to surface on the physiological, neurological, psychological, and social benefits of natural environments and nature immersion (Klepeis, 2001). However, other research shows that people spend about 90 percent of their time inside buildings or vehicles (Klepeis, 2001).

OSMP plays an instrumental role in addressing human wellness by deepening relationships with nature. As reported in the System Overview Report, staff are seeing an increased demand for activities that appear to be in direct response to the stresses of a fast-paced lifestyle. These requests have led to an increase in programs that support relaxation, meditation and unstructured time in nature. These programs include

cognitively appropriate nature play programs for youth and wellness programs for adults that also increase social connectivity and a relationship with the natural environment. In 2018 OSMP offered 24 wellness programs which had 247 participants. These offerings included yoga on Flagstaff Summit, Forest Bathing and contemplative hikes. Staff was invited and presented on the healing aspects of OSMP and nature-immersion, to a sold-out audience at Ignite Boulder. OSMP hikes and outdoor events help build community.

COMMUNITY VOICES

Participants have been receptive to learning about and experiencing the physical and mental health benefits of being in nature. One community member said, "I liked the concept of "sense of belonging" connected to outdoor life. As foreigners, we tend not to have a sense of belonging. The idea of getting some through nature is a good one. Sometimes one needs guidance and your organization seems to provide it."



EXAMPLE IMPLEMENTATION ACTIONS

In response to these emerging needs, implementation of this strategy will involve the continuation or enhancement of programs that help reduce stress for visitors and provide a deeper connection with the land. Best practices such as those described in the [Governor's Office OutdoorRx report](#) would influence our approach to sustaining and improving the health of our community. Partnerships with schools, healthcare providers and community organizations would also be central to developing a coordinated and efficient approach to delivering these programs.

SUPPORTING GUIDANCE

There is currently little direct OSMP policy direction related to this strategy. The [Visitor Master Plan \(2005\)](#) has a fundamental goal of providing high-quality recreation and education to foster visitor enjoyment, connections with the land, and a shared sense of stewardship, which indirectly supports this goal. At a broader level, the [Boulder Valley Comprehensive Plan \(2017\)](#) and the city's [Sustainability and Resilience Framework](#) provide guidance supporting this strategy.

Above: Photo by Darcy Kitching

CCEI.6) INSPIRE ENVIRONMENTAL LITERACY AND NEW INVOLVEMENT IN OSMP

Build the capacity of environmental education to inspire collective stewardship and climate action through comprehensive, collaborative programming across the system.

CONTEXT

Interpretive, educational and service-learning programs encourage land stewardship and understanding about open space. They also stimulate a sense of joy and contentment that improves quality of life in our community.

In both English and Spanish, educational hikes and programs interpret Boulder's landscape, telling of such things as geological uplift, tumultuous floods, and rare plants and animals in decline. Serving about 10,000 people a year, these in-person educational programs encourage competence and capacity to understand nature in new and important ways.

Studies have shown that the following are necessary for the practice of conservation behaviors and stewardship (Chawla, 2012):

- » direct experience in nature;
- » social support for caring about the natural environment; and
- » reoccurring opportunities to learn through experience outdoors.

This growing body of research indicates that environmental education leads to action. Over the years, OSMP staff have seen evidence of this. Interest and participation in volunteer and service-learning opportunities have increased, as more community members learn about OSMP and want to help take care of the land and give back in a meaningful way. Staff has also continued to enhance partnerships with organizations that expand awareness and responsible recreation, such as Leave No Trace Center for Outdoor Ethics.

To ensure open space protection long into the future, we must continue to reach new audiences through research-based programming to inspire awe and encourage understanding of and involvement in nature and open space. As we have also begun to understand climate change, OSMP has incorporated global and local implications into our programming, including volunteer opportunities to control invasive weeds, which are likely to spread further as a result of the climate crisis if left unchecked. We have also begun describing the ways OSMP lands sequester carbon, offset greenhouse gas emissions and preserve ecological function amid rapid environmental changes. In addition, pilot discussion forums at the Ranger Cottage have been held to begin thinking about and discussing what this means for the earth, humanity and open space.





Left: Photo by Nate Schipper

COMMUNITY VOICES

The desire to be involved with OSMP can be seen throughout the community engagement for the Master Plan. One community member said, “Teach skills! Get them integrated with the environment and in communion with it.” Another said they would like to see, “[Spanish; English] Horarios accesibles para ser voluntaria y para los que pueden trabajar en el verano; Accessible hours for those that want to volunteer and for those that can work in the summer” (Engagement Window 3 Summary, 2019). In the 2019 OSMP Master Plan Survey results there was strong support for using education on trail etiquette to help manage areas with high use.

Among those members of the Latinx community who participated in one or more Master Plan focus groups, many valued education highly. In a summary report of findings from these diverse, multicultural residents, staff of El Centro AMISTAD described the importance participants placed on education, training and research:

“The most needed trainings, according to our participants, had to do with climate, hiking culture and natural resources. These trainings need to be inclusive, not just for the Spanish-speaking community, but for all residents.”

EXAMPLE IMPLEMENTATION ACTIONS

This strategy guides staff to enhance and connect environmental education with service-learning to establish a clear continuum of opportunities. Implementation would involve a project to evaluate and update education programs to increase literacy about the interdependence of people and the environment and our role in creating resilient biological communities in response to the climate crisis. Advancing a climate crisis education and action program will require expanding OSMP environmental education programming to include discussion forums, climate crisis education programs and action days working with local partners to advance the urgency required to tackle this most pressing need. Related volunteer opportunities will continue to enlist community support in controlling invasive weeds, among other efforts.

Implementation would also be guided by consistent interpretive program themes that help visitors connect with and appreciate Boulder’s natural, agricultural and cultural history.

The strategy also relates to educational opportunities for youth as described in **CCEI.3) Connect youth to the outdoors**, and to the learning laboratory approach for conservation and recreation described in **EHR.7** and **RRSE.9**. Together, this suite of management approaches will inspire commitments to environmental stewardship, volunteerism, citizen science and resource monitoring.

SUPPORTING GUIDANCE

The [Visitor Master Plan \(2005\)](#) – especially the Education and Outreach initiative and the [Agricultural Resources Management Plan \(2017\)](#) provide high level guidance for this strategy; while the [Trail Study Area Plans \(2005-2016\)](#) provide some guidance on ways that this can be implemented through design and programming at a site-specific level.

CCEI.7) CULTIVATE LEADERS IN STEWARDSHIP

Advance skill-building and training for volunteers and stewards through expanded mentorship and leadership opportunities that increase OSMP's capacity to address needs and support career development in open space management.

CONTEXT

There is strong and growing momentum for advancing skill-building and leadership opportunities through Boulder's citywide volunteer cooperative. In 2018, more than 2,100 OSMP-specific volunteers saved the department about \$500,000, contributing almost 19,000 hours, which is equivalent to 13 full-time employees. OSMP staff also work with volunteers, nonprofits and partners to foster and support volunteer leaders, who in turn further increase our capacity to deliver on City Charter purposes for open space.

After the 2013 flood there was a dramatic increase in community members wishing to volunteer so they could help repair the damage to the OSMP system. This increase brought the community together around a common need and led to more than just an annual increase in volunteer numbers

(**Figure 2.4.2**) - it also led to a greater sense of community. As more challenges appear over the next decade including potentially limited funding, the climate crisis and increasing visitation, we will need more volunteers to work with staff on protecting and maintaining open space.

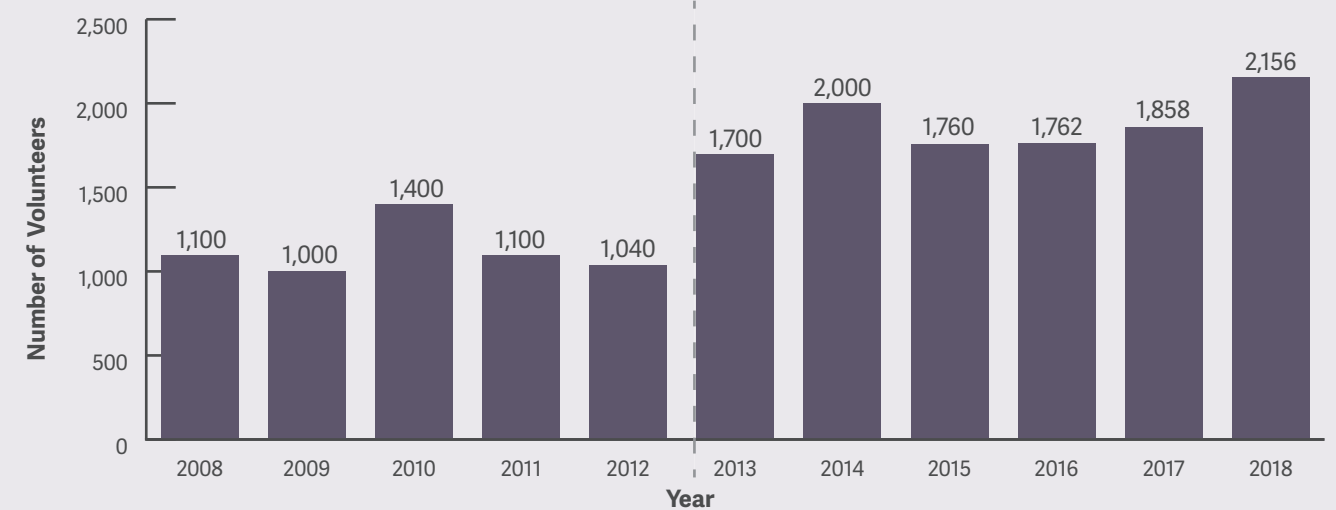
COMMUNITY VOICES

Skill-building and volunteerism have been consistent themes throughout community engagement for the Master Plan. In an online community questionnaire in fall 2018, 42 percent of respondents said they would volunteer more with OSMP if they knew more about opportunities. Forty percent also expressed an interest in personal or career development in open space management saying they would volunteer more if they had opportunities to build skills around land management and conservation.

EXAMPLE IMPLEMENTATION ACTIONS

As interest in stewardship and conservation efforts from the community grows, this strategy guides the development of clear service and leadership pathway programs to cultivate volunteer leaders of all ages who have the experience, confidence and skills to help lead volunteer crews. Implementation would include enhancing mentoring and internship opportunities. For example, we

Figure 2.4.2: Increased Volunteering Over Time. Dashed vertical line represents the increased volunteer effort after the flood of 2013.



are partnering with the I Have a Dream Foundation and City of Boulder Housing and Human Services to support internships to develop web content about ranchers and farmers on OSMP-managed lands.

To increase exposure to and knowledge of land management practices, implementation would also include continuing to expand on-the-ground volunteer projects to include a wider range of opportunities, such as social trail restoration, agriculture, vegetation management, seed collection, forest thinning, trail maintenance and more.

SUPPORTING GUIDANCE

The [Visitor Master Plan \(2005\)](#) identifies the need for enrolling community members in stewardship activities but does not specifically address developing leadership for the future. At a broader level, the [Boulder Valley Comprehensive Plan \(2017\)](#) and the city's [Sustainability and Resilience Framework](#) provide guidance supporting community stewardship in general.

CCEI.8) HEIGHTEN COMMUNITY UNDERSTANDING OF LAND MANAGEMENT EFFORTS

Heighten community and neighborhood understanding and involvement in OSMP management and planning efforts through targeted education, outreach and in-person engagements in support of on-the-ground action.

CONTEXT

After the September 2013 floods, OSMP offered informational hikes and volunteer projects to areas impacted by high waters. Together with the community, we built the vision for restoration and recovery. Almost 1,500 volunteers gave us about 8,000 hours of their time to help rebuild and restore their open space. This type of collaboration is a model for future efforts. Tailored education programs about particular open space areas, resources, or management issues can also support City Charter purposes for open space by inspiring the community, neighborhoods and individuals to care for the nature in their backyards.

COMMUNITY VOICES

Results from the **Community Connection, Education and Inclusion** questionnaire from 2018 indicated that about 40 percent of respondents would volunteer if they had the opportunity to build skills and knowledge around land management conservation. In the same questionnaire nearly 20 percent of respondents indicated they would volunteer if there was the opportunity to

meet in person and socialize. In-person engagement was also prioritized in the 2019 OSMP Master Plan Survey where 57 percent of respondents said they would be likely to educate themselves and participate in OSMP through public lectures, seminars and forums. Another 58 percent of respondents said they would be likely to participate in other in-person educational opportunities.

EXAMPLE IMPLEMENTATION ACTIONS

By positioning community-owned natural lands as places for meaningful experience and learning, this strategy encourages education and involvement in land management plans, programs and projects. Implementation would involve collaboration among staff and volunteers to anticipate and coordinate upcoming efforts. One goal would be to design and implement tailored educational programs in advance of plans or projects and during on-the-ground action to build understanding about the purpose of and need for those projects. Another goal would be to ignite curiosity and discovery as residents become more aware of and involved in important work to care for Boulder's public lands over time.

SUPPORTING GUIDANCE

Both the [Visitor Master Plan \(2005\)](#) and the [Agricultural Resources Management Plan \(2017\)](#) have guidance that supports this strategy through policies, service descriptions and plan strategies to involve community members in stewardship projects.

CCEI.9) PRESERVE AND PROTECT BOULDER'S CULTURAL HERITAGE

Complete and maintain a cultural resource inventory and management plan to improve the protection of cultural resources and landscapes and to connect all peoples with Boulder's past.

CONTEXT

As described in [Chapter 10 of the System Overview Report](#), the Boulder community's relationship with the land and connections to nature have antecedents. In fact, people have lived and thrived on lands currently part of OSMP for more than 10,000 years. A rare cache of very early stone tools, the Mahaffy Cache, was unearthed within a half mile of OSMP lands – and the oldest artifact found on OSMP lands is a Cody Complex arrowhead left by early bison hunters, estimated to be between 6,000 and 7,000 years old.

Stories and pieces of the past that people have left behind inspire an appreciation of the diverse peoples and cultures through time and provide insights into their relationships with the land. The sights, scenes, colors and textures contained within the OSMP system shape the way people interact with natural areas, deepening the interplay among the beauty of Boulder's natural landscapes, history and cultural heritage.

Cultural resources refer to those tangible and intangible aspects of cultural systems, either living or dead and built or natural, that are valued by a culture. Typically, research, planning and stewardship activities involve five cultural resource areas:

- » Cultural landscapes,
- » Historic structures,
- » Archeology,
- » Museum collections, and
- » Ethnographic resources.

Cultural landscapes, for example, are historically significant places that show evidence of human interaction with the physical environment (NPS, 2018). They include human-modified ecosystems, such as forests, prairies and rivers, as well as constructed areas like gathering areas, orchards, or gardens. They are part of a system of cultural resources, which often includes historic structures and other cultural resources. One example on OSMP land is the Flagstaff Mountain Cultural Landscape District (**Figure 2.4.3**). The district includes eight individual features, including for example, the Bluebell Shelter and five structures constructed or rebuilt by the Civilian Conservation Corps in the 1920s and 1930s.

Figure 2.4.3: Cultural Landscapes and City of Boulder Historic Landmarks on OSMP-Managed Lands

HISTORIC LANDMARKS

Hartnagle Farm

Dating to 1898, the Hartnagle Farm is also a late 19th century historic farm and dairy that is significant for its architecture and association with pioneer agriculture and the growth of agriculture in Boulder County.



Hunter-Kolb Farm

Dating to 1905, the Hunter-Kolb Farm is an early 20th-century historic farm that is significant for its architecture and association with the growth of agriculture in Boulder County.

CULTURAL LANDSCAPES

Chautauqua Historic District

Located at the base of the iconic Flatirons overlooking the Boulder Valley, the 40-acre Colorado Chautauqua has provided a variety of programs, such as concerts, debates and recreational activities since 1898. OSMP manages land within and surrounding this national historic landmark.



Flagstaff Mountain Cultural Landscape District

The Flagstaff Mountain Cultural Landscape District is a cultural landscape comprised of features related to recreation in the Boulder Mountain Parks.



Marshall Mesa Historic District

Marshall Mesa Historic District encompasses coal mining sites east of state Highway 93 that were active from 1859 through the 1940s. The first coal mines active in the state of Colorado were at Marshall Mesa.

Additionally, there are opportunities to renovate and protect relics like historic buildings on city property for today's relevant uses. One of the main ways that people currently benefit from these resources is by driving past open space and seeing historic patterns and structures in the landscape such as irrigation ditches, agricultural outbuildings and historic residences among others.

COMMUNITY VOICES

Boulder residents value the history of their landscape as a means of explaining the present and providing a sense of place, value and pride in their community. One community member simply said this, "Preserve more than buildings but the traditions and culture. There are opportunities to tell those stories through resource protection and interpretation." (Engagement Window 3 Summary Report, 2019).

EXAMPLE IMPLEMENTATION ACTIONS

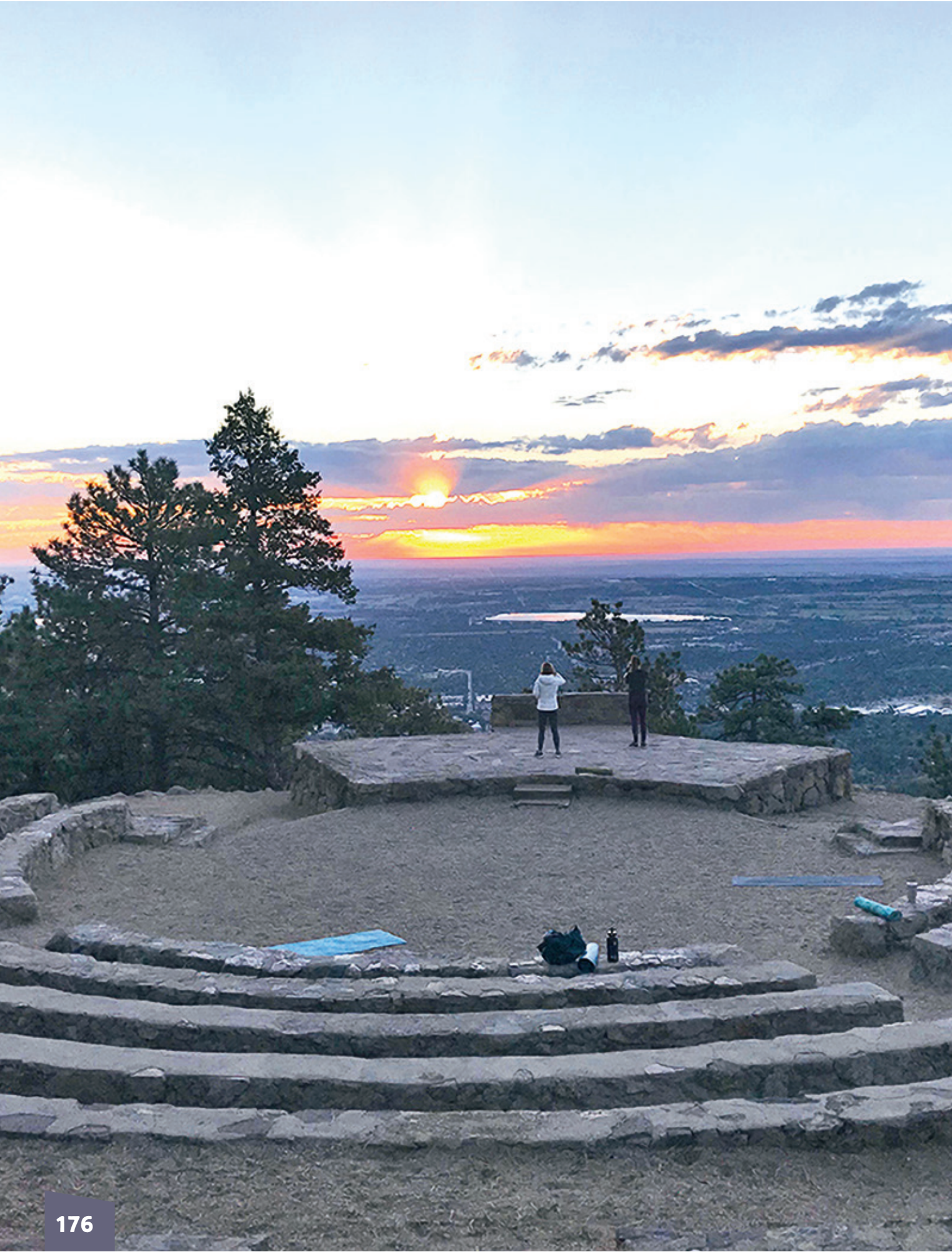
To build off citywide work being done on this strategy, OSMP staff will complete a project that will inventory and assess cultural resources, including cultural landscapes, and to evaluate local, state and national significance in addition to opportunities for interpretation. Integrating with **CCEI.4**, this work will lead to the development and implementation of OSMP's first cultural resources management plan.

We will also prioritize investments in projects that protect cultural landscapes and resources as well as historic districts and historic buildings.

This strategy also involves offering educational opportunities to share stories of Boulder's past, as well as exploring and expanding volunteer opportunities to support cultural resource management (see **CCEI.6**).

SUPPORTING GUIDANCE

No comprehensive plan or strategy has been developed to guide management of all cultural and scenic resources across the OSMP system. Limited guidance can be found in OSMP's Long Range Management Policies (LRMP), past area management plans, as well as in agreements with the State of Colorado and several American Indian Tribal governments. In addition, the OSMP [Visitor Master Plan \(2005\)](#), [Agricultural Resources Management Plan \(2017\)](#) and [Cultural Resources Management Guidelines \(1990\)](#) provide some planning or policy guidance to support this strategy.



Left: Photo by David Ford

Advancing Community-wide Goals

The Master Plan advances community-wide objectives described in the city’s Sustainability and Resilience Framework. For example, outcomes and strategies within the **Community Connection, Education and Inclusion** focus area strongly support and align with the following objectives within this framework:

- » Healthy and Socially Thriving Community;
- » Accessible and Connected Community;
- » Responsibly Governed; and
- » Economically Vital Community.

Outcomes and strategies within **Community Connection, Education and Inclusion** also support and align with BVCP policies, including the following examples:

- » 2.09 Neighborhoods as Building Blocks
- » 2.27 Preservation of Historic and Cultural Resources
- » 2.32 Preservation of Archeological Sites and Cultural Landscapes
- » 8.08 Health and Well-being
- » 10.02 Community Engagement
- » 10.05 Support for Volunteerism
- » 10.06 Youth Engagement

CCEI outcomes and strategies may also inform BVCP updates that incorporate OSMP Master Plan policies. For example, the BVCP does not currently include policy guidance on consulting with American Indian Tribes and supporting Indigenous Peoples.



Left: Photo by Doug Goodin

INTRODUCTION

In this section, we present an overview of our past and current financial situation and describe a set of outcomes and strategies for ensuring financial sustainability on behalf of the public, for whom staff manages OSMP funding. These outcomes and strategies will also guide our land acquisition efforts over the coming decade, as well as internal systems that facilitate high-quality public service.

As of 2018, three citizen-approved sales tax increments accounted annually for about 90 percent of total OSMP revenues, evidence that City of Boulder residents continue to recognize the value of open space to the community. By approving tax increases, Boulder residents have created a remarkable open space legacy for themselves and future generations. Since 1967 when the first municipal tax passed to support city open space, this type of public funding has helped preserve dramatic landscapes and important habitat and created meaningful opportunities for residents to connect with the great outdoors.

After a period of accelerated acquisitions, two of these citizen-approved tax measures supporting OSMP were designed to sunset at certain times to account for declining land acquisition needs over time. Therefore, as planned, OSMP revenues declined in 2019 and are expected to do so again in 2020. Together, with reduced citywide funds for OSMP, our total funding is expected to decline by \$10 million per year starting in 2020. Staff has prepared for these changes over the last several years.

This Master Plan focus area – Financial Sustainability – grapples with these and other changes in support of our first four focus areas. For example, key aspects of this focus area such as stable funding, modern asset management systems, continued acquisitions and an engaged professional workforce are all necessary for successful service delivery for all City Charter purposes for open space.

SECTION 2.5 FINANCIAL SUSTAINABILITY

We steward public funding to fulfill the City Charter purposes for open space.

FINANCIAL OVERVIEW

PAST AND ANTICIPATED REVENUES

In our recent history, about 90 percent of OSMP funding has come from sales and use tax revenues, with remaining funds from the state lottery, grants and fees for parking, facility rentals, commercial and special use permits, Voice and Sight permits, agricultural leases and other property leases as shown in **Table 2.5.1**.

As of 2018, sales and use tax revenues came from three citizen-approved sales tax increments, as described in **Table 2.5.2**. However, OSMP is experiencing significant changes to its current funding structure. One of the three sales tax increments that make up the Open Space Fund was reduced in January 2019. A second will be repurposed for other city business in January 2020. In total, sales and use tax revenue is expected to reduce by about 30 percent or roughly \$9 million.

In addition, an annual transfer of \$1 million from the city’s general fund to OSMP also ends in 2019. Like the sales tax increment changes, the expiration of general funding has been expected and planned for, but this change will further tighten total revenues for OSMP, amounting to an overall \$10 million annual reduction.

OSMP has been preparing for budget reductions through a series of actions to minimize the impact, including:

- » paying down outstanding obligations for past acquisitions,
- » maintaining strong fund balances,
- » improving efficiency of internal processes,
- » expiring vacant positions where appropriate,
- » scaling back or deferring projects and programs,
- » being responsible stewards of Open Space Fund dollars in a fiscally constrained time, and
- » increasing reserve funds to account for economic fluctuations.

In 2006, after a period of frequently declining revenues, the Boulder City Council appointed a Blue Ribbon Commission to study revenue policy issues confronting the city. The commission’s 2008 report to council identified strategies and practices to stabilize revenues over the short- and long-term. Recommendations included:

- » Renew expiring sales taxes without a sunset;
- » Diversify revenues;
- » Review fees for appropriate cost recovery; and
- » Leverage diverse funding and revenue opportunities.

Table 2.5.1: 2018 Revenue Type and Amount

REVENUE TYPE	ACTUAL 2018 REVENUE
Net Sales Tax Revenue	\$31,906,622
Federal Emergency Management Agency (FEMA) Flood Reimbursement	\$12,478
Investment Income	\$580,892
Lease and Miscellaneous Revenue	\$906,607
Lottery	\$428,000
General Fund Transfer	\$1,080,529
Grants	\$51,016
TOTAL 2018 REVENUES	\$34,966,144

Table 2.5.2: Sales Tax Details

YEAR APPROVED	AMOUNT	TERMS
1967	0.40 percent	Approved in perpetuity
1989	0.33 percent	<ul style="list-style-type: none">• Was reduced to 0.22 percent January 1, 2019• Will be reduced again January 1, 2035 to 0.10 percent and exist in perpetuity
2003	0.15 percent	<ul style="list-style-type: none">• Will be repurposed for transportation uses as of January 1, 2020• Will be repurposed again for general city purposes January 1, 2030• Will expire December 31, 2039

Master Plan strategies build on this guidance to strengthen and update OSMP's financial management approach. For example, strategy **FS.1) Stabilize funding** describes intentions to further enhance the diversity of revenue streams to support OSMP operations. Strategy **FS.2) Budget for future uncertainty** also addresses funding and spending limitations, as well as other external factors that could impact OSMP's annual budgets over the next 10 years. For example, extreme weather events, rising land values, increasing visitation, cyclic economic conditions and other factors could impact both available revenue and spending needs.

PAST AND CURRENT SPENDING

A look back on the last decade reveals a pattern of dips and spikes in spending (**Figure 2.5.1**), in particular around flood recovery and major open space acquisitions. Strong financial management enabled these expenditures. For example, annual saving or carryover supported planned, one-time expenditures on important land acquisitions, contributing to overall increases in spending, as seen in 2018 in the figure below. That year, roughly \$18 million was spent on six acquisitions, including Boulder Valley Farm and Fort Chambers / Poor Farm among others. In addition, we have continued building contingency reserves and maintaining the Open Space Fund balance.

Annual budgets are typically designed to include capital improvements, planning efforts, programs and projects, base operations and maintenance, annual debt payments, cost allocation and reserves.

As described in the [2018 System Overview Report](#), the City of Boulder's Capital Improvement Program (CIP) is a six-year plan for public investments in physical improvements. It is an essential implementation tool for carrying out the Boulder Valley Comprehensive Plan's policies for the orderly and efficient provision of urban facilities and services.

For OSMP, the capital improvements budget typically funds acquisitions, major maintenance projects to restore habitat or improve trail conditions, needed upgrades to agriculture and water-related infrastructure, and major planning efforts. As such, it is also an important tool for funding implementation of the OSMP Master Plan.

Our annual CIP budget for OSMP in recent years has ranged from about \$5 million to \$11.5 million. However, **Figure 2.5.2** below shows the CIP budget by year since 2012 to demonstrate that spending during flood recovery (peaking around \$11 million in 2016) exceeded the pre-flood average CIP budget for the department (\$4 to \$5 million annually).

Figure 2.5.1: OSMP Spending Over Time

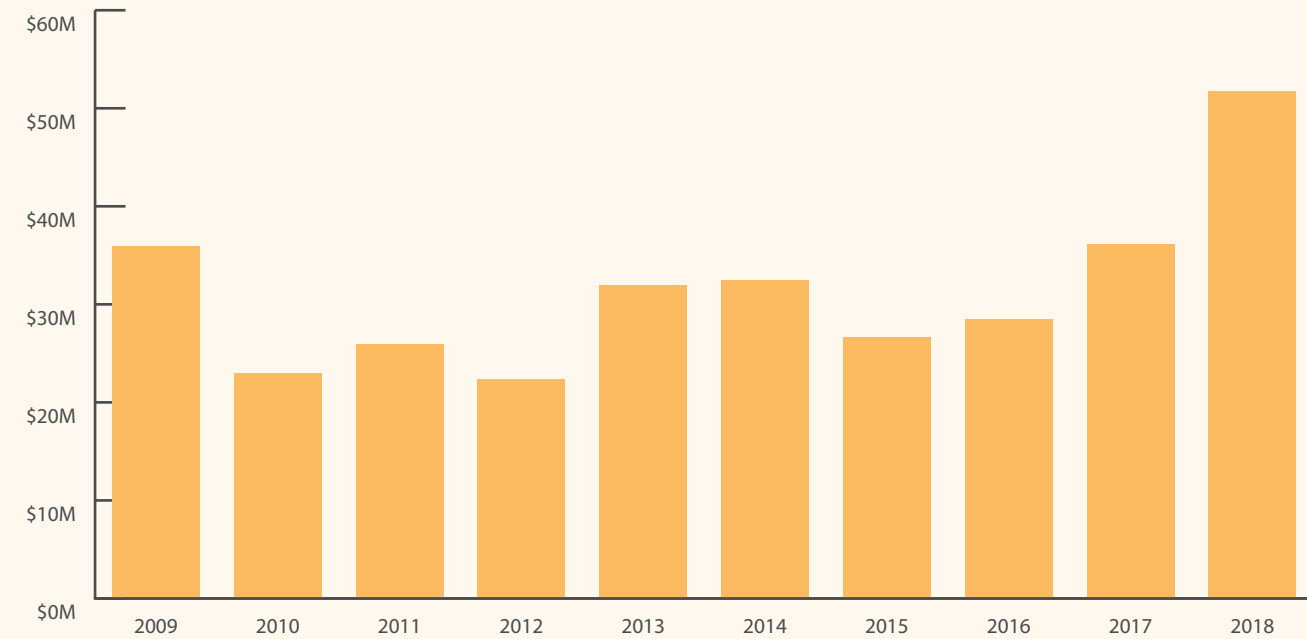


Figure 2.5.2: Total CIP Budget by Year (NOTE: 2020 budget is shown as proposed as of September 2019.)

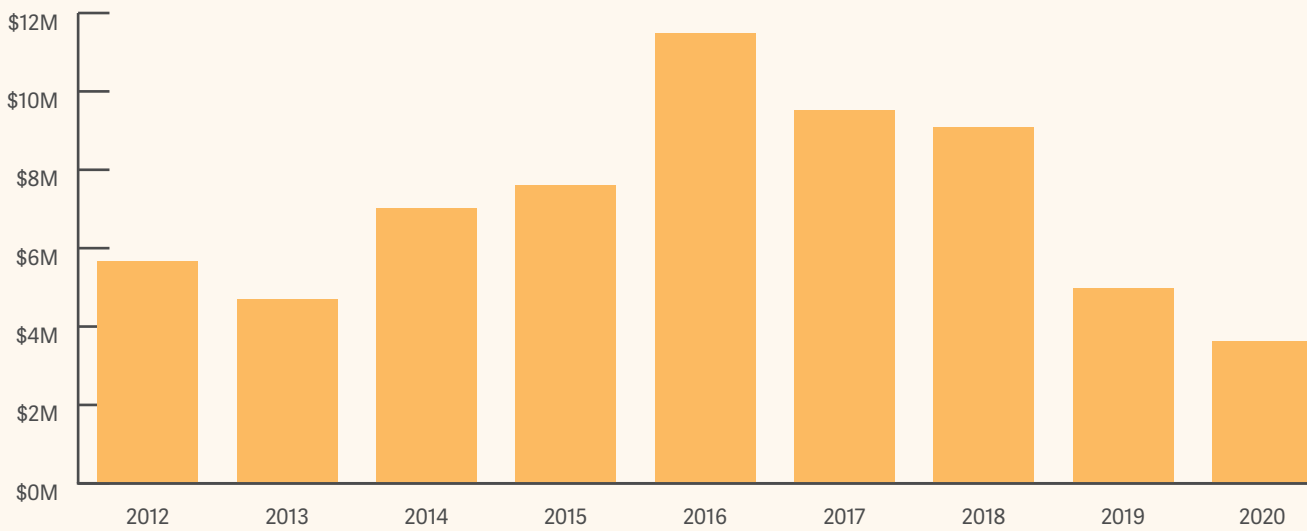




Photo by Jack Sasson

OUTCOMES

Financial Sustainability

Thinking ahead to the next decade of CIP spending, a likely \$10 million annual reduction in total revenues will limit our capacity to fully fund Master Plan implementation. In addition, we provide basic community services – like rangering to increase visitor safety – that require funding and staffing to do them well.

With this context in mind, the following outcomes describe staff and community aspirations for OSMP over the next decade and beyond. They describe an ideal future in which financial sustainability has been achieved and maintained.

FS. A) LASTING VALUE FOR THE COMMUNITY	OSMP effectively and efficiently manages city taxpayer dollars to build both trust and lasting open space value.
FS. B) RESILIENCE TO CHANGE	Financial management strengthens adaptability and resilience to local, national and global market forces and environmental change.
FS. C) PROTECTED INVESTMENTS	The community's long-term investment in open space is protected or enhanced by prioritizing maintenance of OSMP properties and assets.
FS. D) TARGETED ACQUISITIONS	Strategic acquisitions of land, mineral and water interests continue to play an important role in preserving, enhancing and managing Boulder's legacy of preservation, agriculture and passive recreation.
FS. E) EFFECTIVE COMMUNICATION	Financial information is proactively and clearly communicated to promote accountability, increase community understanding of OSMP financial management, and ensure alignment of spending with community priorities.

STRATEGIES: Financial Sustainability

In support of all other focus areas, the following strategies describe our management approach for funding, budgeting, internal systems, acquisitions, workforce development and planning.

Financial Health and Asset Management

FS.1) STABILIZE FUNDING

Steadily generate funds through sales and use tax collections while strategically leveraging other revenue streams and local dollars to support OSMP’s capacity to deliver open space services.

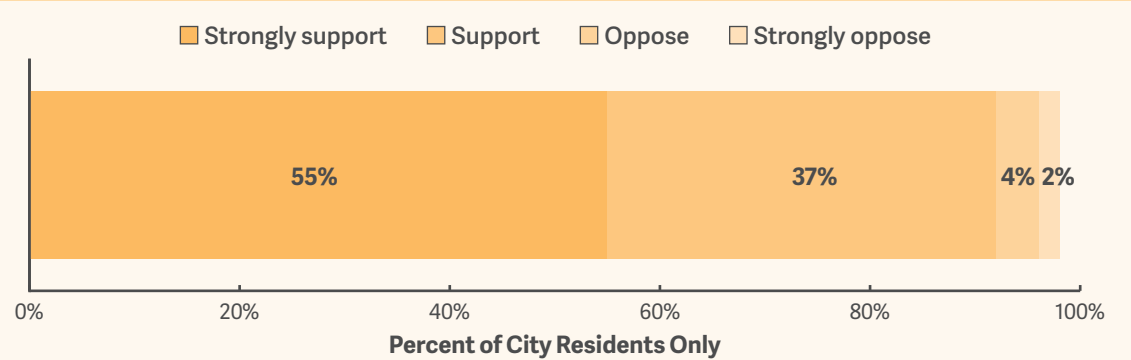
Managing sales tax revenues and diversifying funding streams where appropriate are critical in continuing to maintain a large land management system. Approximately 10 percent of OSMP funding comes from sources other than sales tax, including state lottery funds, grants and fees such as

parking, facility rentals and permits. Further program diversification would include additional grant coordination, partnerships and a review of fee structures as it relates to strategy **RRSE.5) Manage passive recreation activities requiring an OSMP permit.**

COMMUNITY VOICES

In the 2019 OSMP Master Plan Survey, city residents were asked if they would support a tax measure to restore dedicated sales tax revenues to OSMP. Of those who shared an opinion, support was quite strong, with about 9 in 10 saying they would strongly support or support (Figure 2.5.3).

Figure 2.5.3: City Residents’ Support for Tax Measure



Right: Photo by Tevis Morrow

FS.2) BUDGET FOR FUTURE UNCERTAINTY

Create, optimize, and manage budgets that anticipate major change drivers such as extreme weather events and fluctuations in revenue and spending.

By responsibly developing and managing department budgets, OSMP will maintain the public trust and communicate department strategic direction. We also recognize that cyclic economic conditions can affect available revenue, causing fluctuations from year to year. Expenses over the last 10 years varied from year to year, which will likely continue over the next decade.

Fires and floods will also get more intense and more frequent in years to come, requiring us to save for those rainy or hot days ahead. This strategy will guide an agile budget program that anticipates and prepares for financial realities in years to come. We will incorporate lessons learned from the 2013 flood and continue to maintain reserves that can support operations during extreme weather events and/or disaster response and recovery.



FS.3) UNDERSTAND TOTAL COST OF SYSTEM MANAGEMENT

Adopt or create models to understand the total value and cost of managing the OSMP system and its many diverse assets, including impact and investment tracking for upfront and ongoing costs regarding land management, agriculture, trails and other infrastructure.

Effective management systems and processes are critical to the work we do in the field and to the ways visitors enjoy and help care for the system. For example, resource assessments and inventories help us identify critical needs and opportunities. They also track investments over time and identify process improvements to help ensure effective use of public funding.

As we increasingly use technology to improve business practices, we are better able to understand current conditions and recognize the entire costs of managing all aspects of the system. We get better at clearly communicating the state of the OSMP system to the public for whom it is managed. We improve our ability to attend to the greatest needs. For example, by knowing and comparing the relative condition of forests to grasslands, we can invest time and money in the most important places.

Implementing this strategy would include updating programs to improve our inventory of assets, green and built, as well as building better cost estimating tools to understand and anticipate life-cycle costs for all programs and services. For example, we hope to better understand the full cost of addressing invasive weeds and agricultural conflicts with prairie dogs, which requires additional data gathering, analysis and ongoing information management to fully describe. Building a comprehensive asset management system will include trails, agricultural infrastructure, education, enforcement and habitats. It will also involve making strategic program investments in technology to best manage, analyze and report data.

FS.4) TAKE CARE OF WHAT WE HAVE

Focus capital investments on retaining the health of ecosystems on OSMP properties, as well as maintenance of existing trails, amenities and agricultural infrastructure.

Our legacy system has grown dramatically in size and is facing greater challenges from climate change and increased visitation. As we continue to acquire more land or build new trails, we also add maintenance and management costs over the long-term. Just as regular visits to the doctor keep us healthy, preventive maintenance of our

Figure 2.5.4: Restoring a landscape such as this one - where agricultural practices and long-term prairie dog occupation have degraded the health of native grasslands - is more expensive and difficult than maintaining good conditions for healthy ecosystems. (Photo by Eric Fairlee)



assets extends their life cycle. Therefore, programs maintaining existing assets will be emphasized more than projects adding new trails, properties or other assets.

Similarly, preservation of healthy ecosystems should be prioritized as it is more cost-effective than restoring degraded ecosystems. See **EHR.1) Preserve and restore important habitat blocks and corridors.**

COMMUNITY VOICES

Taking care of what we have can be some of the most rewarding and important work we, as OSMP staff do, especially when it involves partnerships with community volunteers to take care of the land. For example, the Flatirons Climbing Council (FCC) holds an annual “Trash Bash,” when members pick up garbage, maintain climbing trails, define safe and enjoyable climbing routes, and communicate climbing route closures to protect raptors. As one OSMP Volunteer stated, “Volunteering with OSMP has made me realize how important it is to use open spaces wisely and participate in its future and its preservation.”

In the 2019 OSMP Master Plan Survey, when it came to trails within the OSMP system, three-quarters of respondents preferred that OSMP focus more on the maintenance and design of existing trails, while one-quarter preferred that OSMP focus on building new trails. Roughly the same percentage preferred conserving ecosystems on existing lands over acquiring new lands to conserve. Both examples reflect a larger interest in taking care of what we have, but still allowing for new acquisitions that support conservation, add trails, or improve agriculture as part of a strategic approach to planning for system expansion. This feedback confirms our current approach. For example, as the percentage of our budget spent on acquisitions has gone down over time, we have increased spending on conservation and maintenance of existing properties, trails and other assets ([System Overview Report](#)).

Acquisitions and Property Interests

FS.5) PRIORITIZE ACQUISITIONS IN BOULDER VALLEY’S RURAL PRESERVATION AREA

Prioritize opportunities to acquire land, mineral and water interests in the Area III – Rural Preservation Area – of the Boulder Valley Comprehensive Plan to advance its goals, OSMP Master Plan focus areas and City Charter purposes for open space.

Since 1898, roughly \$650 million has been spent to protect 46,000 acres of open space. This bold and innovative approach has created a large land management area around Boulder that is both unique and complex. Protecting a large percentage of the land around Boulder has created an open space system three times the size of the city itself. As large-scale opportunities for land acquisitions in the Boulder Valley decline, the pace of OSMP acquisitions is slowing and property values are forecast to increase (see **Figure 2.5.5**). However, building on the [2013 OSMP Acquisition Plan Update, 2013 - 2019](#), Master Plan strategies on acquisitions (**FS.5**, **FS.6** and **FS.7**)

Figure 2.5.5: Acquisition by Decade since 1967 Sales Tax

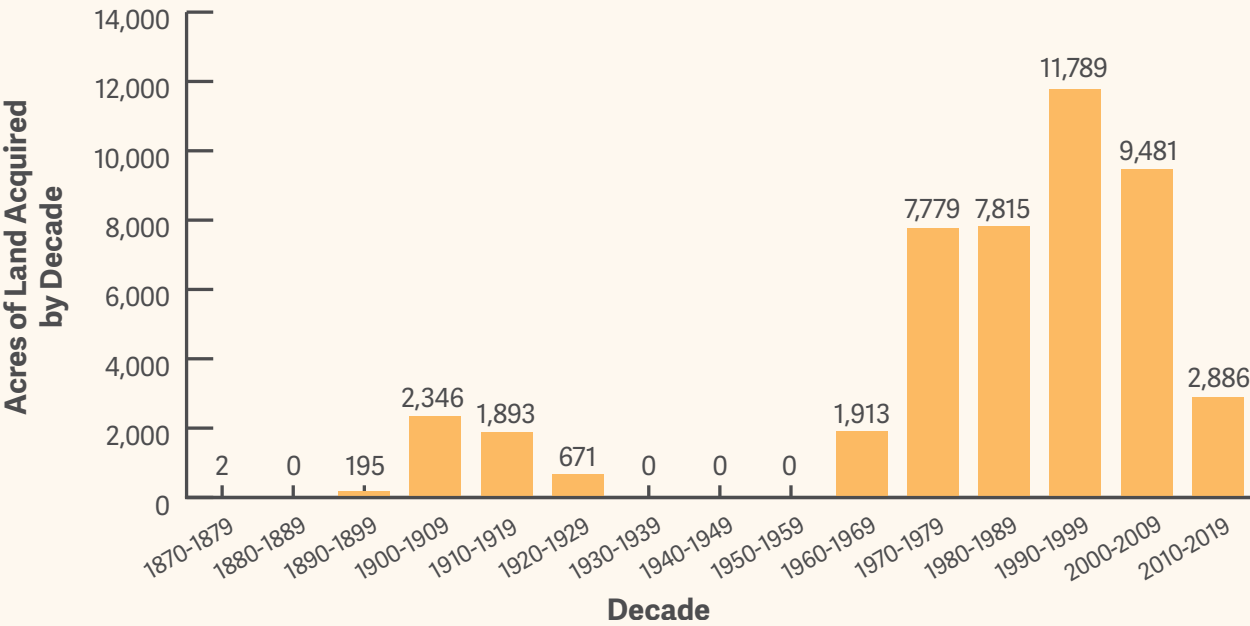
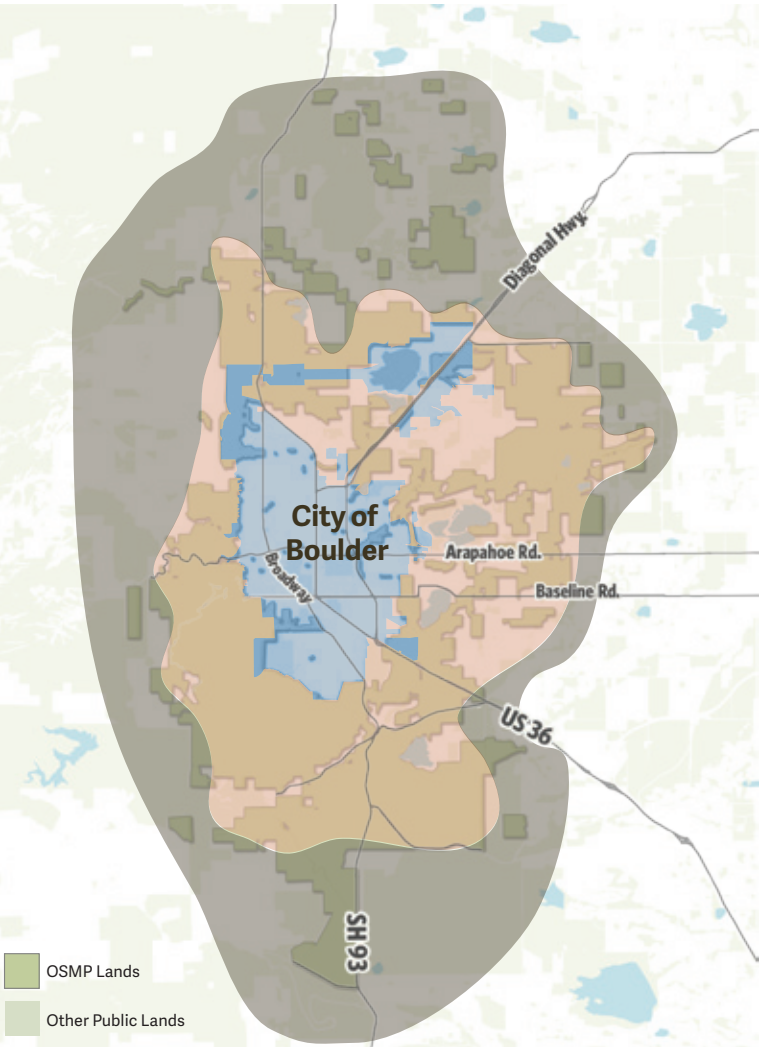


Figure 2.5.6: Acquisition Areas



Revised Acquisition Areas

Strategic acquisition of land, mineral and water interests in these areas will help preserve, enhance and manage Boulder’s legacy of conservation, agriculture and passive recreation.

- City of Boulder**
Within city limits, there are few potential acquisitions that may fulfill City Charter purposes for open space.
- Priority Acquisition Area**
Opportunities for acquisitions in the Area III – Rural Preservation Area of the Boulder Valley Comprehensive Plan (BVCP) Area would be prioritized. Opportunities within Area II will be considered only when coupled with planning, development or annexation projects or where citywide priorities or partnership opportunities emerge. There are roughly 2,200 acres of potential acquisitions in this priority area that may fulfill City Charter purposes for open space.
- Partnership Acquisition Area**
Opportunities for acquisitions outside the Priority Acquisition Area may be considered, especially when partnerships with other city departments, land management agencies or organizations could expand OSMP’s ability to preserve important land. Around 8,000 acres of potential acquisitions that may fulfill City Charter purposes for open space exist in this area.

The boundaries of the Acquisition Areas are approximate. They do not conform to specific geographic or political boundaries and are for illustrative purposes only.

demonstrate that important acquisition opportunities remain to further protect and enhance Boulder’s legacy of land conservation.

As the OSMP system matures, future acquisitions of land, water and mineral interests must be more strategic and focused to help take care of what we have (see **FS.4**) *Take care of what we have*). For example, acquiring land in areas where invasive species are threatening existing OSMP properties would allow greater control and restoration success. This

level of focus also translates into specific areas in which OSMP would prioritize opportunities to acquire land, water and mineral interests (see **Figure 2.5.6**).

In the Boulder Valley Comprehensive Plan (BVCP), a compact between the City of Boulder and Boulder County detailing how land should be developed or preserved, the Area III - Rural Preservation Area are lands around the city where community members have agreed it is important to limit development and preserve rural landscape character. In keeping with the

BVCP and OSMP’s 2013-2019 Acquisition Update, Area III lands would; therefore, remain an important geographic focus for OSMP’s acquisitions program in order to achieve these community-wide goals. Approximately 2,200 acres in the Area III – Rural Preservation Area – can serve OSMP charter purposes and help advance Master Plan outcomes and strategies through future acquisitions over time.

COMMUNITY VOICES

Findings from Master Plan engagement suggest that it is important to both continue our acquisition program and to emphasize the care and maintenance of all lands we currently own and acquire. For example, respondents to the 2019 OSMP Master Plan Survey ranked acquisitions as one of our

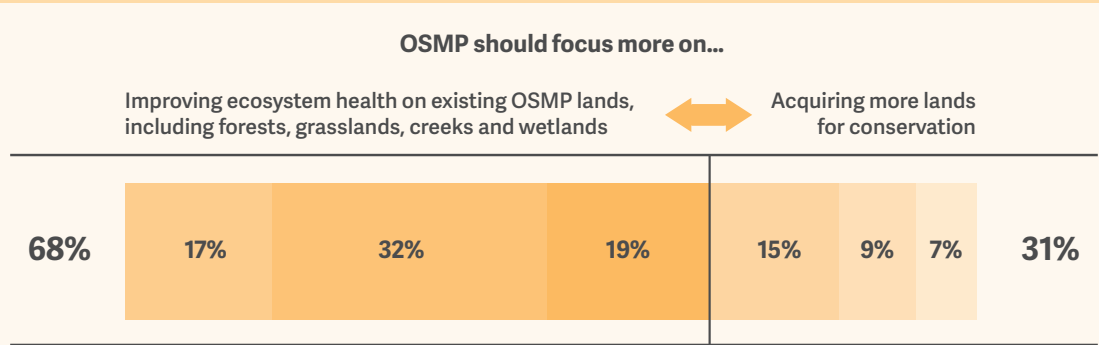
top priorities in one survey question, and in another, placed more emphasis on improving ecosystem health on existing lands over acquiring new lands (Figure 2.5.7).

Roughly 9 in 10 respondents also identified the following two reasons as most important for acquiring new properties in the future:

- » to protect waterways such as floodplains, rivers, streams and wetland areas; and
- » to protect and connect high-quality habitat for plants and animals.

Based on the rural landscape character of Area III, potential acquisitions in this part of the Boulder Valley would offer opportunities to advance these community priorities for the acquisition program.

Figure 2.5.7: Resident preferences on balancing conservation of existing lands with acquiring new ones to conserve on a spectrum (2019 OSMP Master Plan Survey)



Above: Photo by Doug Goodin

FS.6) PARTNER TO PROTECT LANDS BEYOND THE PRIORITY AREA

Consider acquisition of land, mineral and water interests outside the Boulder Valley Comprehensive Plan boundary where partnership opportunities help leverage costs and advance Master Plan focus areas and City Charter purposes for open space.

All open space acquisitions depend on the right opportunity presenting itself at the right time. Consistent with FS.5) Prioritize acquisitions in Boulder Valley’s Rural

Preservation Area above, this acquisition strategy addresses opportunities beyond the boundaries of the Boulder Valley Comprehensive Plan as they arise. It guides staff to consider these opportunities in these areas preferably in partnerships with other agencies or organizations in order to leverage initial and ongoing costs (Figure 2.5.6 on page 191). Doing so would allow OSMP to build connections that expand habitat blocks and improve trail connections. For example, the recent partnership with Jefferson County Parks and Open Space to jointly purchase Lippincott Ranch preserves new wildlife corridors and protects scenic viewsheds. Under this program model, OSMP staff will partner with neighboring counties and municipalities to acquire and protect land beyond the BVCP planning area.

Left: Photo by Dave Sutherland

FS.7) PARTICIPATE IN OTHER ACQUISITION OPPORTUNITIES

Consider acquisition of land, water and mineral interests within Area I and II of the Boulder Valley Comprehensive Plan only when coupled with planning, development or annexation projects or where citywide priorities or partnership opportunities emerge.

Acquiring property interests within other areas of the BVCP planning area is infrequent and usually tied to specific citywide priorities or coupled with a land use or development project. In Area I, which is within city limits, and in Area II, where the city and county have agreed that annexation into the city may be considered, there may from time to time be future needs to use partnerships to acquire real estate interests for open space purposes. OSMP estimates that approximately 250 combined acres in Areas I and II could serve City Charter purposes for open space and help advance Master Plan outcomes and strategies. See **Figure 2.5.6** above.

In Areas I and II, this strategy involves partnering with other city departments to evaluate the appropriateness of potential acquisitions with the BVCP land use designation Open Space-Other (OS-O) as they become available or go through the city's planning and development review processes. The OS-O land use designation represents the city and county's long-standing interest in potential preservation through a range of mechanisms. In some cases, potential acquisition by OSMP may be appropriate, where the OS-O designation directly aligns with City Charter purposes for open space and acquisition would advance Master Plan outcomes and strategies.

FS.8) EVALUATE EXISTING REAL ESTATE ASSETS ON OSMP LANDS

To improve the protection of, and align with, open space purposes in the City Charter, assess real estate assets and explore alternative preservation and stewardship options to better enable staff to steward and manage for those purposes.

Over the long history of OSMP acquisitions, assets such as buildings, houses, agricultural structures, and/or other real estate interests have been acquired. Often these interests were acquired as part of a larger real estate deal, where the central purpose for acquisition was to support preservation, agriculture or passive recreational activities.

Today, some of these properties or structures may not serve City Charter purposes directly or efficiently. In some cases, they are also difficult to manage due to lengthy travel time to reach them. We can strengthen OSMP's ability to preserve important ecosystems, trails and other assets by reducing short- and long-term maintenance needs for real estate assets that are not serving City Charter open space purposes.

For example, a project to evaluate houses and related infrastructure owned and managed by OSMP will explore appropriate management approaches. Where doing so would improve OSMP's ability to steward mission-critical assets elsewhere on the system, options may include repurposing residences for agricultural tenants or ranger use, exploring partnerships in the management and/or ownership of real estate interests, or deconstructing or selling residences.

Operations and Planning

FS.9) INVEST IN WORKFORCE DEVELOPMENT AND OPERATIONAL NEEDS

To provide effective management of the OSMP system over time, maintain a team-oriented workforce that benefits from experience and ongoing training and is equipped with adequate resources to meet the expectations of the community.

Investing in our own staff creates a dynamic system of experts that can provide greater value to the community at large. It also reduces employee turnover, increasing our return on investment over the long term. This strategy involves investing in staff training and development to maintain effective and relevant open space services. It also includes improving collaboration with other city departments to eliminate inefficiencies of overlapping responsibilities including how we work together on citywide issues that require partnerships and collaboration.

This strategy also involves updating a program evaluating needs for staff offices, maintenance yards and other operational needs. This will require careful consideration to ensure costs are kept to a minimum, yet facilities can still serve staff needs for a maturing land system. In addition, any updates to facilities should include a community and volunteer component that is welcoming and provides for greater understanding of how land management operations are carried out.

FS.10) UPDATE PLANNING FRAMEWORK

Refine OSMP planning methods and products to better inform and prioritize the efficient use of limited funding.

Financial sustainability for OSMP involves knowing in advance what work is needed to sustain the system over time and ensuring money is available to address the greatest needs and opportunities. Planning does just that – it offers community members, OSMP staff and decision makers the chance to discuss ideas and determine the most effective approaches for future management.

It will become increasingly important for OSMP plans to present recommendations that are informed and constrained by financial realities. Future planning will help pinpoint the most important work that can be achieved with anticipated funding and staffing levels.

To that end, this strategy directs staff to re-evaluate our approach to planning. The new framework must fully integrate all City Charter purposes for open space into decision-making. It must provide management guidance for natural, agricultural, recreational, cultural and scenic resources, as well as programming for education, enforcement, maintenance and operations. With many systemwide plans already in place covering the aforementioned functions of the department, some systemwide plans could be updated while others will be new for OSMP.

Refinements to the existing planning framework will also likely include guidance regarding approaches for both broad area planning and site planning for specific areas. This approach will involve implementation of Master Plan strategies through a series of follow-up planning efforts that will inform more detailed work planning and budgeting (see **Section 4**). For example, conceptual site plans for smaller geographies would guide

management in areas with concentrated visitor amenities like trailheads. This level of integrated site planning – done within a broader area planning process – would enable projects to be implemented immediately after plan completion, with clear documentation of feasibility, benefits, cost and other relevant attributes of these finer scaled sites. Area plans would then inform systemwide work planning and capital improvements planning by providing a set of prioritized actions, related costs and a phased approach for implementation within financial and staffing constraints.

Developing and confirming the above planning approaches will follow completion of the Master Plan. OSMP staff will further explore potential changes to the department's strategic approach to planning with the Open Space Board of Trustees in 2020.




Photo by Gail Kezele

Advancing Community-wide Goals

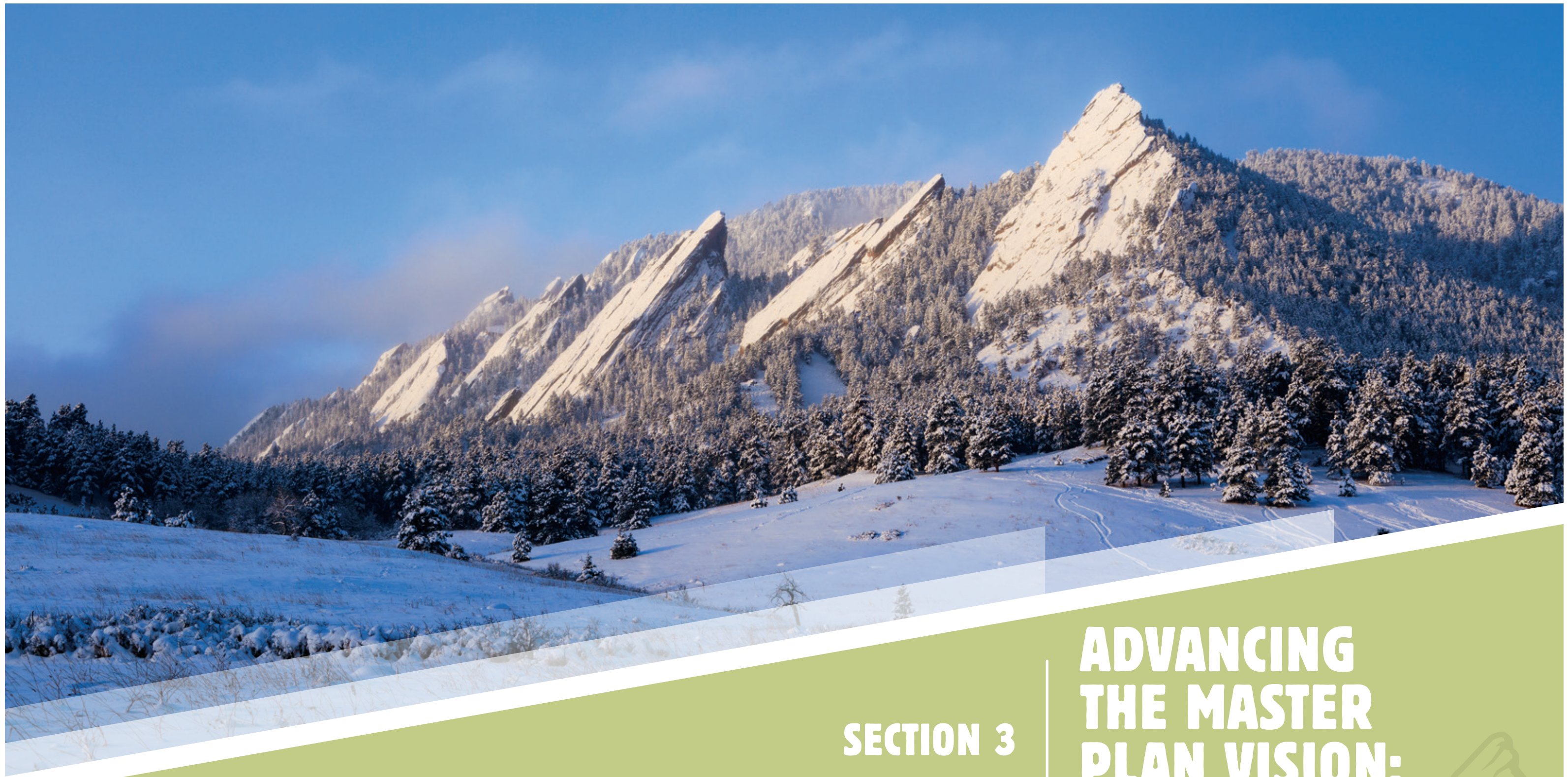
The 2019 OSMP Master Plan integrates the [Sustainability and Resilience Framework](#) into its outcomes and strategies within each focus area in order to ensure alignment with citywide priorities. Outcomes and strategies within Financial Sustainability strongly support and align with the following goals within this framework:

- » Responsibly Governed Community;
- » Economically Vital Community; and
- » Safe Community.

Outcomes and strategies within Financial Sustainability also support and align with BVCP policies, including the following examples:

- » 2.04 Open Space Preservation
- » 5.15 Economic Resilience
- » 10.01 High-Performing Government
- » 10.02 Community Engagement

Guidance in this focus area will also support community conversations in the future as the BVCP periodically gets updated.



Above: Adobe
Stock Image

SECTION 3

ADVANCING THE MASTER PLAN VISION: PRIORITIZATION AND FUNDING



SECTION 3

ADVANCING THE
MASTER PLAN VISION:
PRIORITIZATION & FUNDING

Left: Photo by Jack Sasson

Introduction

As **Section 2.5** describes, Open Space and Mountain Parks (OSMP) staff have been preparing for a planned \$10 million budget reduction in 2020 for the last several years. Despite these reductions, we want to continue building trust and providing lasting value for the community. The goal is to spend our time and money in ways that advance our shared values, focus areas, outcomes and strategies to fulfill the Master Plan vision.

Even so, reduced funding will mean difficult decisions about what aspects of service delivery will be emphasized over others. Even services or Master Plan strategies that are emphasized will likely not be fully funded. While we aspire to doing more with less money, the reality is that some needs will not be fully addressed without additional funding and conditions in parts of the overall system may decline over time despite our best attempts to maintain what we currently have. **Section 4** of the plan will describe how we will get to work on action planning for implementation of the Master Plan.

This section responds to these concerns with a realistic, responsible and optimistic approach to funding and implementing the Master Plan vision for the next decade.

To do so, this section:

- » Lays out the comparative importance of strategies to clarify expectations and inform achievable work plans for staff that align with community priorities;
- » Describes three potential funding levels over the next ten years that may be available to support implementation of the Master Plan vision; and
- » Defines the comparative importance of each focus area to align funding with community values.

PRIORITY STRATEGIES

COMMUNITY ENGAGEMENT FINDINGS

Engagement with our community, the Open Space Board of Trustees (OSBT) and City Council confirmed the primary importance of the **Ecosystem Health and Resilience** focus area. Across all focus areas, we also heard a request to emphasize taking care of what we have and placing less emphasis on new land acquisitions and building new trails. More specifically, community members consistently stated the following two management actions were very important:

- » restoring degraded ecosystems and wildlife habitat; and
- » maintaining and improving existing trails and visitor amenities.

In addition, the following actions emerged as important:

- » preparing for extreme weather events;
- » engaging underserved communities, including the Latinx community, and those experiencing disabilities, as well as youth; and
- » impacts to visitors’ experiences and the natural environment in light of increased visitation trends.

TIER 1 STRATEGIES

Community, OSBT and Council as well as staff input (described more in Appendix A) informed the prioritization of strategies. As a result, Master Plan strategies are organized into

three tiers. The following Tier 1 strategies were identified as most important to the community, staff, OSBT and City Council at this time:

TIER 1

- » *EHR. 1) Preserve and restore important habitat blocks and corridors*
- » *EHR. 2) Update and continue implementing system plans guiding ecosystem management*
- » *EHR. 3) Address the global climate crisis here and now*
- » *ATT. 1) Reduce maintenance backlog for agriculture and water infrastructure*
- » *ATT. 2) Increase soil health and resilience*
- » *ATT. 3) Address conflicts between agriculture and prairie dogs*
- » *RRSE. 1) Assess and manage increasing visitation*
- » *RRSE. 2) Reduce trail maintenance backlog*
- » *CCEI. 1) Welcome diverse backgrounds and abilities*
- » *CCEI. 2) Enhance communication with visitors*

Staff will accelerate or emphasize these Tier 1 strategies with more staff time and funding, especially in the first few years of Master Plan implementation. We will still put incremental funding and effort towards other strategies in Tiers 2 or 3 (shown in **Table 3.1**), but with respectively less emphasis or urgency and depending on capacity and opportunities.

FUNDING NEEDS BY STRATEGY

To support effective and efficient use of public expenditures, especially as our funding is set to decline, staff developed general planning-level cost estimates for each strategy to understand what we need to budget for over the next 10 years. These estimates were also designed as orders of magnitude to help the reader compare which strategies will require more or less funding to implement. They also help differentiate and prioritize funding needs for Master Plan implementation. For example, Tier 1 strategies would generally be prioritized with more emphasis over other implementation efforts and would be funded closer to the full need.

It is important to keep in mind that these cost estimates are general and relative in nature and are not intended to represent a precise amount of our full need for each strategy. As strategy FS.3) Understand total cost of system management demonstrates, over the next 10 years continuing to build and advance internal asset management systems will improve our ability to more accurately estimate and track the full cost of managing our complex open space system.

Nevertheless, the general cost ranges shown for each strategy in **Table 3.1** reflect what it would take to fully implement the Master Plan’s 10-year vision for that strategy. As such, they do not reflect actual or specific decisions regarding how much will be spent towards each strategy. That level of

decision-making will be done annually in consultation with OSBT, Planning Board and City Council through budget approval. Rather, these order of magnitude cost estimates can be understood as an optimistic budget for implementing each strategy at the highest level of funding staff can reasonably anticipate over a decade. These estimates also reflect a responsible and realistic outlook on constraints, such as staff capacity, that would limit our ability to spend additional money above these levels without significant, unanticipated and unlikely increases including, but not limited to staffing levels and public engagement needs.

Table 3.1 summarizes how Master Plan strategies were prioritized and compares that with an estimate of the full funding needed over 10 years to implement each strategy to the fullest extent in keeping with the community’s vision for the next decade. To understand these order of magnitude estimates, it is helpful to note that infrastructure projects are often more expensive than other staff-led plans, programs and projects. For example, strategies that involve construction – such as those that involve major trail maintenance (*RRSE.2*) or major restoration of riparian areas, wetlands, or other habitat areas (*EHR.1*) – require materials, vehicles, machinery and permitting that contribute to higher costs. For other efforts such as inclusive programming (*CCEI.1*), smaller investments may go further in advancing the guiding strategies.

Table 3.1: Master Plan Strategy Priorities and Funding Needs*

TIER	STRATEGY	TEN-YEAR FUNDING NEEDS TO FULFILL MASTER PLAN VISION*
1	EHR. 1) Preserve and restore important habitat blocks and corridors	\$\$\$\$\$
1	EHR. 2) Update and continue implementing system plans guiding ecosystem management	\$
1	EHR. 3) Address the global climate crisis here and now	\$\$
1	ATT. 1) Reduce maintenance backlog for agriculture and water infrastructure	\$\$
1	ATT. 2) Increase soil health and resilience	\$\$\$\$
1	ATT. 3) Address conflicts between agriculture and prairie dogs	\$\$\$
1	RRSE. 1) Assess and manage increasing visitation	\$\$
1	RRSE. 2) Reduce trail maintenance backlog	\$\$\$\$\$
1	CCEI. 1) Welcome diverse backgrounds and abilities	\$\$
1	CCEI. 2) Enhance communication with visitors	\$\$
2	EHR. 4) Reduce undesignated trails	\$\$
2	EHR. 5) Extend on-trail requirements	\$\$
2	EHR. 6) Control invasive species	\$\$\$
2	EHR. 7) Develop a learning laboratory approach to conservation	\$\$\$
2	ATT. 4) Protect water resources in a warmer future	\$
2	ATT. 5) Encourage diverse and innovative agricultural operations	\$\$\$
2	RRSE. 3) Update guidelines and standards for quality trail design and construction	\$
2	RRSE. 4) Encourage multimodal access to trailheads	\$\$\$
2	RRSE. 5) Manage passive recreation activities requiring an OSMP permit	\$
2	CCEI. 3) Connect youth to the outdoors	\$\$\$\$
2	CCEI. 4) Support citywide engagement with federally recognized American Indian Tribes and Indigenous Peoples	\$

A NOTE ON PRIORITIZATION

Financial Sustainability – the Master Plan’s fifth focus area – is central to our ability to implement all other focus areas. Therefore, except for the acquisition-related strategies, the **Financial Sustainability** strategies described in **Section 2.5** were not prioritized in relation to those in the other four focus areas as they support implementation of strategies in the other four.

It is also important to note that through annual consultation with the Open Space Board of Trustees (OSBT) and City Council during the budget approval process, strategies may get reassigned to different tiers, especially as substantial progress is made, or as unforeseen needs arise.

TIER	STRATEGY	TEN-YEAR FUNDING NEEDS TO FULFILL MASTER PLAN VISION*
3	EHR. 8) Reduce impacts from noise, light and nearby land uses	\$\$
3	EHR. 9) Reduce and offset OSMP greenhouse gas emissions	\$\$\$\$\$
3	ATT. 6) Support the success of ranchers and farmers	\$\$\$
3	ATT. 7) Integrate native ecosystems and agriculture	\$\$
3	ATT. 8) Further reduce or eliminate pesticide use	\$\$
3	ATT. 9) Enhance enjoyment and protection of working landscapes	\$\$\$
3	RRSE. 6) Support a range of passive recreation experiences	\$\$
3	RRSE. 7) Build new trails as guided by past and future plans	\$\$\$\$\$
3	RRSE. 8) Provide welcoming and inspiring visitor facilities and services	\$\$\$\$\$
3	RRSE. 9) Develop a learning laboratory approach to recreation	\$\$
3	CCEI. 5) Foster wellness through immersion in the outdoors	\$\$
3	CCEI. 6) Inspire environmental literacy and new involvement in OSMP	\$\$\$
3	CCEI. 7) Cultivate leaders in stewardship	\$\$
3	CCEI. 8) Heighten community understanding of land management efforts	\$\$
3	CCEI. 9) Preserve and protect Boulder’s cultural heritage	\$\$\$
3	Acquisitions (FS.5, FS.6, FS.7)	\$\$\$\$\$

KEY*

\$	\$0 to 500,000
\$\$	\$500,000 to 2,000,000
\$\$\$	\$2,000,000 to 5,000,000
\$\$\$\$	\$5,000,000 to 10,000,000
\$\$\$\$\$	\$10,000,000 to \$40,000,000

**The key defines dollar ranges for 10-year funding needs according to the highest potential funding level we might expect for Master Plan implementation. As such, they align with our full funding scenario as seen in Section 3 of the Master Plan.*

While the table above provides us with informative general cost ranges associated with each Master Plan strategy, it is important for setting realistic expectations for the future to understand that even if some strategies were to receive full funding over the next decade, certain limitations will

constrain our ability to address all ongoing needs related to all strategies. For example, invasive weeds or trail maintenance present ongoing management challenges that staff will continue addressing well beyond the 10-year Master Plan vision.

Future Funding for Implementing Master Plan Vision

OVERVIEW

Implementing and funding the Master Plan vision will require a strategic approach to managing the budget over the next decade. Staff worked with the community, OSBT and City Council to anticipate what the future may look like, prepare for different options, and focus investments in time and money on shared priorities. The following three funding scenarios (further described in **Table 3.2**) show different funding levels that may be available for implementing the Master Plan’s vision for the next decade:

- 1. Constrained Funding:** This scenario reflects the planned \$10 million annual budget reduction starting in 2020. The aim in this scenario is to maintain what we have, while accepting some aspects of the system may go from good condition to fair or even poor in certain situations.
- 2. Restored Funding:** This scenario describes what may happen if a new sales tax were to restore some funding for OSMP, bringing total revenues closer to 2018 levels. The aim in this scenario is to both maintain and where possible improve what we have, while accepting some aspects of the system may still experience a decline in condition.

- 3. Full Funding:** This scenario anticipates the potential for additional funding beyond scenario 2 levels through a more diversified revenue approach. This scenario assumes OSMP revenues could support robust implementation to the full extent the community envisions for the next 10 years. The aim in this scenario is to not only maintain and improve conditions but where possible transform them, and aggressively tackle emerging needs such as the climate crisis and increasing visitation.

Under both our constrained and restored funding scenarios, actions in support of Tier 1 strategies in the Master Plan would be emphasized, especially in the first few years of implementation. Staff would kick-start plan implementation by initially devoting the most time and funding to these programs, projects and plans, while still advancing other strategies at a slower rate. If additional funding becomes available, staff would scale up efforts and funding as illustrated in **Table 3.2**.

Table 3.2: Overview of Future Funding Levels over 10 Years

THREE POTENTIAL FUNDING LEVELS			
Funding Level	Constrained	Restored	Full
Percent of Community’s Vision for the Decade Achieved	30 percent	60 percent	100 percent
Investment in Strategies	Limited funding focused on accelerating Tier 1 strategies first; investment in Tier 2 and 3 strategies only as capacity allows	Additional funding scales up work on Tier 1 strategies; investment level improved for Tier 2 and 3 strategies	All strategies are funded at full need over ten years
Return on Investment	Conditions throughout the system are maintained overall. Some areas may improve, while others may decline as costs go up over time.	Conditions throughout the system are maintained. Important areas are improved, such as restoring habitat and reducing trail backlog, increasing soil health and expanding youth engagement.	Conditions throughout the system are enhanced. All achievable work towards the Master Plan 10-year vision is completed, including proactive stewardship that deepens connections with nature and inspires a resilient future. Aggressive steps are taken to tackle the climate crisis, increasing visitation, the future of agriculture and inclusive, nature-based learning.

CONSTRAINED FUNDING LEVELS

At constrained funding levels, with a \$10 million annual budget reduction compared to 2018 funding levels, staff would initiate Master Plan implementation by focusing time and money, especially in the first few years, on Tier 1 strategies. These strategies – and the outcomes they advance – would directly guide work planning and budgeting, especially in the first few years.

Under this constrained funding scenario, annual funding for capital improvements, plans, programs and projects would emphasize maintenance of existing lands, trails and programs over new initiatives and acquisitions. For example, reducing a portion of the trail maintenance backlog would be emphasized over adding new trail mileage. While new trail mileage may be added as called for in existing approved plans under this scenario, less funding would be devoted to it. New or enhanced efforts that we are unable to initiate early in our 10-year planning horizon would be pursued later or as staff capacity and funding allow.

This approach reflects findings from the 2019 OSMP Master Plan Survey, in which three-quarters of respondents would prefer that OSMP focus more on the maintenance and design of existing trails, while one-quarter preferred that OSMP

focus on building new trails. Roughly the same percentage preferred conserving ecosystems on existing lands over acquiring new lands to conserve (2019 OSMP Master Plan Survey). In response, staff will continue to focus on taking care of what we have while advancing investments in new acquisitions, trails or other infrastructure at a slower rate.

It is important to note in this fiscally constrained scenario, the overall level of service OSMP can provide may go down. For example, staff can accomplish fewer restoration and acquisition projects and less trail and facility maintenance under these financial constraints. In addition, OSMP will not be able to fully address emerging needs in this scenario including increasing visitation, weeds, conflicts between agriculture and prairie dogs, and recovery from potential disasters as well as being unable to implement a major, comprehensive response to the climate crisis. This means that while the prioritization of Master Plan strategies would guide work planning and budgeting, few of them would be fully funded as limited funding has to cover a wide variety of department needs. Instead, gradual progress would be made over time for most strategies, and conditions at some locations across the system may not improve or may even decline as projects and programs get deferred until more funding and resources become available.

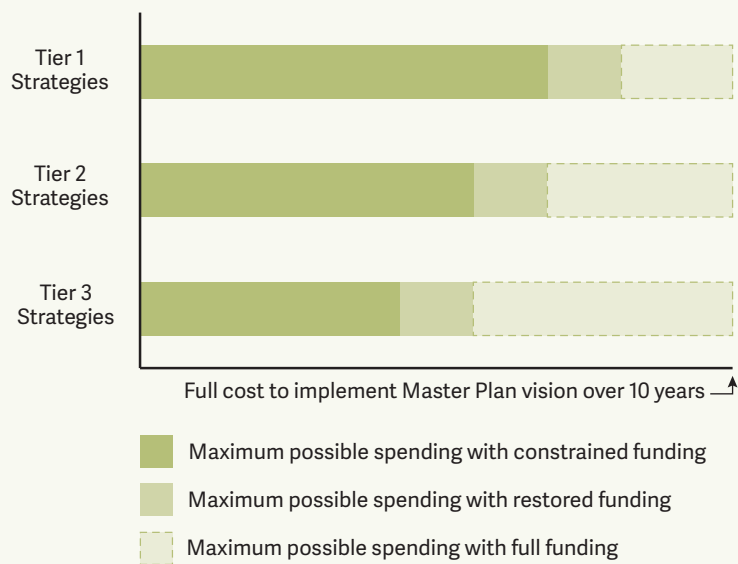
POSSIBILITIES WITH ADDITIONAL FUNDING

The 2019 OSMP Master Plan Survey found that 92 percent of city residents would support a measure to restore sales taxes for OSMP back to 2018 levels. If, in the future, residents were to support a restoration of some or all of that sales tax funding for OSMP, additional funding would come available in the future, bringing revenues closer in line with 2018 levels.

As **Figure 3.1** illustrates, this additional funding would be distributed to align with community priorities. With an emphasis on Tier 1 strategies, it would support scaled-up implementation efforts and allow staff to improve conditions in certain parts of the system. Under this restored funding scenario, some needs would still remain unmet over our 10-year planning horizon.

Specifically, additional funding would provide greater capacity to pursue more restoration and conservation projects, make additional progress toward reducing the trail maintenance backlog, and incorporate more forward-thinking approaches to responding to the climate crisis, improving soil health, and increasing youth engagement, inclusion and volunteers. OSMP’s work program would still support implementation across all focus areas, with an emphasis on **Ecosystem Health and Resilience** and **Responsible Recreation, Stewardship and Enjoyment**.

Figure 3.1: Conceptual illustration of how funds will be distributed over 10 years, depending on three possible levels of funding



Beyond additional sales taxes for OSMP, more funding may also be generated through grants or other sources of funds. For example, under the **Financial Sustainability** focus area, **FS.1) Stabilize funding** captures staff intentions to diversify and stabilize revenue by seeking grants and other options such as those available through Great Outdoors Colorado (the state lottery) and the Land and Water Conservation Fund, among others. If funding were to exceed 2018 levels, capacity would increase to address programs and projects previously reduced or deferred. Under this full funding scenario, these additional funds would allow full implementation of the Master Plan vision, improving conditions



Left: Photo by Linda Mahoney

across the system and transforming the ways OSMP staff, partners and community members share in the stewardship of open space landscapes in a resilient future.

Ultimately, additional funding scenarios would improve our ability to achieve the Master Plan vision. Among others, especially with respect to:

- » increasing the size and quality of habitat blocks,
- » working with the community to meet the climate crisis head on,
- » managing increasing visitation,
- » eliminating undesignated trails, and
- » improving our facilities so visitors continue to make memorable connections with nature.

By way of example, **Tables 3.3, 3.4** and **3.5** illustrate how additional funding would enhance our ability to implement programs and projects in support of four sample Master Plan strategies – three of which are in Tier 1. Cost ranges in these tables are order of magnitude estimates only and do not represent specific budget decisions regarding any one implementation action. Instead, the annual budget approval process with OSBT, Planning Board and City Council will determine how OSMP funds are spent to implement the Master Plan.

Table 3.3: Illustrative Examples of Scaling Implementation Actions to Match CONSTRAINED Funding Levels

CONSTRAINED FUNDING				
STRATEGY	EHR.1) Preserve and restore important habitat blocks and corridors	ATT.2) Increase soil health	RRSE.2) Reduce trail maintenance backlog	CCEI.3) Connect youth to the outdoors
TIER	1	1	1	2
EXAMPLE ACTION	Creek conservation, restoration	Carbon farming	Trail maintenance	Junior Ranger Program
WHAT CAN BE DONE OVER 10 YEARS <i>(with current funding levels)</i>	Conserve and maintain high-quality creek corridors Restore high priority creek corridor in fair or poor condition Continue limited monitoring	Continue existing research pilot projects Improve irrigation and other infrastructure to support carbon farming	Support 4,000-5,000 trail volunteers over 10 years and 7-10 large projects	Continue to support nine crews per year that work on: - conservation and trail projects - Ranger Youth Corps skills - environmental education programs
HOW MUCH OF IT WILL BE DONE OVER 10 YEARS	3.5 to 5 miles of creek restored	2,000 to 3,000 acres of irrigated land treated	Routine maintenance on 15 to 20 miles of trail; preventive or major maintenance for 5 to 7 miles	900 Junior Rangers served
MAXIMUM POSSIBLE SPENDING OVER 10 YEARS <i>(Actual amounts will vary and will be allocated during annual budget approvals)</i>	\$5,600,000-\$8,000,000	\$4,000,000-\$5,000,000	\$6,000,000-\$8,500,000	\$4,000,000-\$4,500,000

Table 3.4: Illustrative Examples of Scaling Implementation Actions to Match RESTORED Funding Levels

RESTORED FUNDING				
STRATEGY	EHR.1) Preserve and restore important habitat blocks and corridors	ATT.2) Increase soil health	RRSE.2) Reduce trail maintenance backlog	CCEI.3) Connect youth to the outdoors
TIER	1	1	1	2
EXAMPLE ACTION	Creek conservation, restoration	Carbon farming	Trail maintenance	Junior Ranger Program
WHAT CAN BE DONE OVER 10 YEARS <i>(with restored funding levels)</i>	Increase habitat connectivity Expand monitoring Create opportunities for new partnerships	Expand research projects and apply learnings to additional lands Improve irrigation and other infrastructure to support carbon farming Initiate education and training efforts	Support 6,000-7,000 trail volunteers over 10 years and 10-20 large projects	Support up to 14 total crews per year and expand program to develop a Youth Advisory Board, close undesignated trails, and develop a Climate Education Curriculum.
HOW MUCH OF IT WILL BE DONE OVER 10 YEARS	5 to 7.5 miles of creek restored	3,000 to 4,500 acres of irrigated land treated	Routine maintenance on 30 to 40 miles of trail; preventive or major maintenance for 9 to 12 miles	Up to 1,300 Junior Rangers served
MAXIMUM POSSIBLE SPENDING OVER 10 YEARS <i>(Actual amounts will vary and will be allocated during annual budget approvals)</i>	\$8,000,000- \$13,000,000	\$5,000,000- \$6,000,000	\$11,000,000- \$15,000,000	\$4,500,000- \$5,500,000

Table 3.5: Illustrative Examples of Scaling Implementation Actions to Match FULL Funding Levels

FULL FUNDING				
STRATEGY	EHR.1) Preserve and restore important habitat blocks and corridors	ATT.2) Increase soil health	RRSE.2) Reduce trail maintenance backlog	CCEI.3) Connect youth to the outdoors
TIER	1	1	1	2
EXAMPLE ACTION	Creek conservation, restoration	Carbon farming	Trail maintenance	Junior Ranger Program
WHAT CAN BE DONE OVER 10 YEARS <i>(with full funding)</i>	Solidify habitat connectivity Expand systemwide monitoring to understand and address effects of climate crisis Increase partnership potential	Apply innovative practices to additional lands Further improve irrigation and other infrastructure to support carbon farming Formalize and expand education and training programs	Support 8,000-10,000 trail volunteers over 10 years and 40 large projects	Support up to 18 total crews per year and transform the program to develop forestry, restoration and research crews, year-round projects, expanded programming for 11- to 22-year-olds.
HOW MUCH OF IT WILL BE DONE OVER 10 YEARS	7.5 to 10 miles of creek restored	4,500 to 6,000 acres of irrigated land treated	Routine maintenance on 45 to 60 miles of trail; preventive or major maintenance for 16 to 20 miles	Up to 1,600 Junior Rangers served
MAXIMUM POSSIBLE SPENDING OVER 10 YEARS <i>(Actual amounts will vary and will be allocated during annual budget approvals)</i>	\$13,000,000- \$18,000,000	\$6,000,000- \$7,000,000	\$25,000,000- \$35,500,000	\$5,500,000- \$7,000,000

Integrated Funding Guidance for Focus Areas

As stewards of public funding, staff are always seeking process improvements that maximize value for taxpayers. To that end, staff asked Boulder residents the degree to which each Master Plan focus area is important for the future of Boulder’s open space system. The goal is to ensure – at any level of funding – that our spending is in alignment with community values and that we balance investments accordingly. The figure below (**Figure 3.2**) illustrates that of those who responded to this question on the 2019 OSMP Master Plan Survey, at least 91 percent felt all focus areas are at least somewhat important, with **Ecosystem Health and Resilience** emerging as the most important.

The relative importance of each focus area influenced a set of overall funding targets to guide spending on the Master Plan vision over the next decade. Under all funding scenarios and all funding levels, staff will align implementation spending with each focus area. As **FS.2) Budget for future uncertainty** describes, staff need flexibility in designing and managing budgets to account for uncertainty such as future floods we cannot predict. This proactive and transparent approach to uncertainty is reflected in the range of spending targets described in **Table 3.6**.

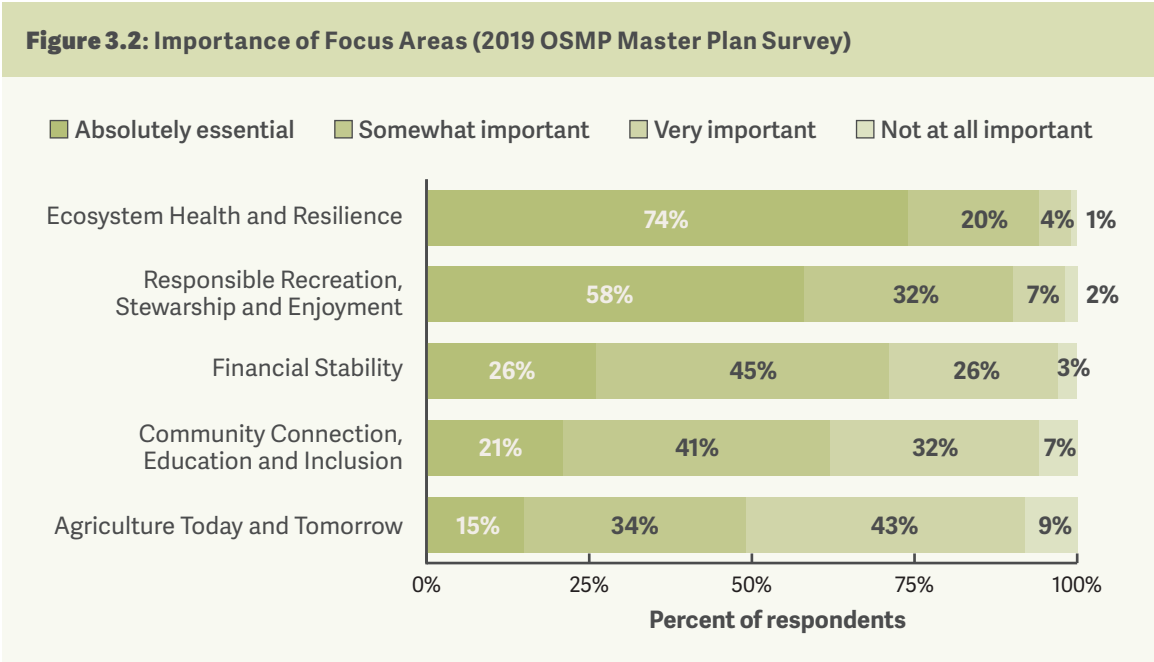


Table 3.6: Ten-year Average of Master Plan Implementation Spending

FOCUS AREAS	10-YEAR SPENDING TARGET AS PERCENT OF TOTAL MASTER PLAN IMPLEMENTATION BUDGET
Ecosystem Health and Resilience	25-40%
Responsible Recreation, Stewardship and Enjoyment	20-35%
Agriculture Today and Tomorrow	15-30%
Community Connection, Education and Inclusion	10-25%
Financial Sustainability*	10-25%

* Plans, programs and projects under the Financial Sustainability focus area – including acquisitions – often support multiple City Charter purposes for open space and outcomes across multiple focus areas. In some cases, these projects may meet specific charter purposes or focus area outcomes, in which case the cost of those efforts may be assigned to a primary focus area. Examples include inventories for agricultural and water infrastructure (ATT), acquiring properties that connect critical habitat (EHR), or purchasing land for trail connections as guided by past and future plans (RRSE).



**Above: Photo by
Dave Sutherland**

SECTION 4

ACTION PLAN



Left: Photo by Rolf Reiser

This section will kick-start an integrated approach implementing the Master Plan community vision. It gives examples of actions OSMP staff will take to help implement the most important strategies (Tier 1) and illustrates the ways this work supports multiple focus areas, strategies and priorities. After Master Plan adoption, staff will continue enhancing internal work-planning processes to guide Master Plan implementation and will also plan and initiate engagements with the Open Space Board of Trustees (OSBT) and City Council aimed at assessing implementation progress and reassessing priorities.

Detailed, multiyear work planning will be an important tool for staff in relation to Master Plan implementation. Recently, staff has significantly improved internal systems to anticipate, coordinate, prioritize and track our planning efforts, programs and projects. We will build on this progress to describe and incorporate the specific planning efforts, programs and projects that advance the Master Plan's policy guidance. Our goal is to have a prioritized, multiyear work plan in place by 2020. This would be accompanied by a longer-term outlook on how we hope to incorporate policy guidance from the Master Plan over the next decade.

SECTION 4 ACTION PLAN

An Integrated, Resilient Future

In stewarding a complex system, our charge over the next decade is to implement the Master Plan efficiently and effectively. This will mean working with partners, volunteers and other community members to make implementation efforts come alive as we continue our work together. This will also mean looking for programs and projects that simultaneously advance multiple focus areas, strategies and priorities.

Efforts to increase soil health (**ATT. 2**), for example, involve soil regeneration and storing atmospheric carbon in degraded agricultural soils. This practice – called carbon farming – involves an integrated approach to responsible agricultural practices, land restoration, weed management, and grassland health. As such, implementation of **ATT. 2** would not only advance outcomes, strategies and priorities within the **Agriculture Today and Tomorrow** focus area, but also **Ecosystem Health and Resilience** as staff studies, develops and shares lessons learned in responding to the global climate crisis. Educational efforts under the **Community Connection, Education and Inclusion** focus area also would augment this work, helping inspire current and future generations to share in a collective effort to preserve and restore our precious natural and agricultural landscapes.

More broadly, addressing the global climate crisis requires a holistic approach to understanding direct impacts to OSMP lands and the role they play in future solutions for the region and planet. Therefore, while **EHR.3 Address the global climate crisis here and now** speaks directly to this work, implementation will involve integrating programs and projects across multiple focus areas and strategies to address this pressing issue. **Table 4.1** illustrates potential programs and projects that support and incorporate multiple strategies into a systems-based approach to addressing rapid environmental change.

Figure 4.1:
Interrelationships
between all
Master Plan
focus areas

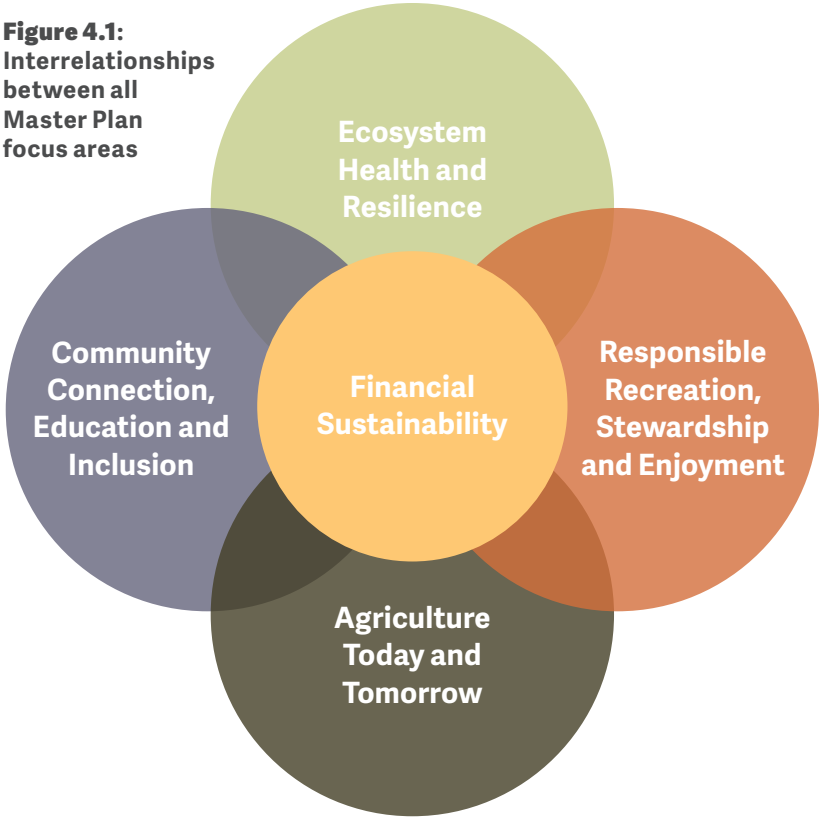


Table 4.1: An Integrated Approach to Addressing the Global Climate Crisis

FOCUS AREA	POTENTIAL IMPLEMENTATION PROGRAMS AND PROJECTS THAT ADDRESS THE GLOBAL CLIMATE CRISIS
Ecosystem Health and Resilience (EHR)	<ul style="list-style-type: none">• Protect and enhance the ability of ecosystems and species to withstand and adapt to rapid environmental change (EHR.1);• Continue the management of entire ecosystems and key ecological processes, such as fire, flood and drought (EHR. 1, 2);• Limit additional stress to wildlife by preventing or reducing disturbance from visitation and adjacent land use (EHR. 5, 7);• Increase the ability of wildlife to migrate by preserving and restoring large habitat blocks, including the restoration of undesignated trails (EHR.1, 4);• Prevent the spread of invasive weeds in novel climate conditions (EHR. 6);• Reduce and offset greenhouse gas emissions related to OSMP departmental operations in support of the citywide climate commitment (EHR. 8);• Assess climate change hazards, vulnerabilities and risks to inspire proactive management approaches (EHR. 9).
Agriculture Today and Tomorrow (ATT)	<ul style="list-style-type: none">• Maintain and improve existing agricultural and irrigation infrastructure to ensure water delivery in a warmer future (ATT.1, 4);• Lead and partner on restoration projects, soil regeneration and carbon sequestration on farms and ranches (ATT. 2);• Analyze and manage data on OSMP’s portfolio of water rights to inform future planning efforts and encourage resilience and efficiency in a more variable climate (ATT. 4);• Strengthen local food systems to reduce greenhouse gas emissions from long-distance food transport (ATT.5);• Develop an agricultural ecology program to further facilitate integration of agricultural productivity and ecosystem conservation (ATT. 7);

(Continued on next page)

Table 4.1: An Integrated Approach to Addressing the Global Climate Crisis (Continued from previous page)

FOCUS AREA	POTENTIAL IMPLEMENTATION PROGRAMS AND PROJECTS THAT ADDRESS THE GLOBAL CLIMATE CRISIS
Responsible Recreation, Stewardship and Enjoyment (RRSE)	<ul style="list-style-type: none">• Update and implement best practices for improving the resilience of trails and visitor facilities to sustain more frequent and intense weather events (RRSE.3);• Consider and provide facilities such as water stations to mitigate more incidences of heat stress (RRSE. 8); and• Reduce greenhouse gas emissions from visitor travel through coordinated multimodal solutions to and from OSMP lands (RRSE.4).
Community Connection, Education and Inclusion (CCEI)	<ul style="list-style-type: none">• Develop new environmental literacy programs (CCEI. 6) designed for and developed in partnership with youth (CCEI. 3) that will highlight the roles OSMP lands play in sequestering carbon and encourage youth to think about and take action toward fixing the climate crisis; and• Continue on-the-ground volunteer projects to include a wider range of opportunities, including activities that make OSMP lands better able to adapt to rapid environmental change such as social trail restoration, vegetation management, seed collection, forest thinning, and trail maintenance (CCEI. 7).
Financial Sustainability (FS)	<ul style="list-style-type: none">• Continue acquiring large properties or areas adjacent to existing OSMP lands (FS.5, FS.6, FS.7) to build connections that expand habitat blocks and their resilience to rapid environmental change;• Continue acquiring wetlands and lands inside floodplains (FS.5, FS.6, FS.7) to limit floodplain encroachment, encourage natural ecosystem function, and reduce risk to human life and property;• Leverage other revenue streams, like grants and carbon markets, to pay for climate action (FS.1);• Incorporate climate change into all levels of planning (FS.10); and• Create, optimize and manage budgets that anticipate major change drivers such as extreme weather events and fluctuations in revenue and spending (FS.2).

Implementing Programs and Projects

Because the Master Plan incorporates planning guidance approved before Master Plan development, OSMP staff have been addressing many Master Plan strategies for years. As such, little or no additional planning is needed for these, allowing OSMP to take immediate actions towards these strategies using existing planning and policy guidance.

For Master Plan strategies with existing relevant guidance, staff and the community have understandings about the policy direction that enables staff to take action. For example, because the Agricultural Resources Management Plan (Ag Plan) was completed in 2017, that guidance directly informed Master Plan strategies in the **Agriculture Today and Tomorrow (ATT)** focus area. Therefore, most **ATT** strategies can be advanced through initiatives, like developing a native plant propagation program, already approved in the Ag Plan.

For high priority Tier 1 strategies, example implementation actions are summarized in **Table 4.2**. Many of these programs or projects support or enhance staff work that is already underway, or they reflect and confirm existing goals from past plans, policies or citywide guidance. Other initiatives have emerged from community and staff input shared throughout the Master Plan process and are sufficiently guided by the Master Plan to support early implementation.

In all cases, the preliminary examples described below are not exhaustive and do not include the full suite of programs and projects that will help advance Master Plan implementation over the next decade and beyond. Instead, prior to more detailed work planning yet to come, these examples are intended to provide an initial picture of the types of on-the-ground actions that will occur.

Table 4.2: Example Implementation Programs and Projects for High Priority Strategies

TIER 1: HIGH PRIORITY STRATEGY	EXAMPLE IMPLEMENTATION PROGRAMS OR PROJECTS
EHR.1) Preserve and restore important habitat blocks and corridors	Staff will continue advancing projects to restore lower Boulder Creek, reclaiming gravel pits to support native fish and amphibian habitats. Staff will recontour the land including redistributing waste piles left over from gravel mining. We will also seed and plant native vegetation while managing weeds. Snapshots of current conditions and post-reclamation monitoring will contribute data to report on creek health.
EHR.2) Update and continue implementing system plans guiding ecosystem management	Implementation of this strategy involves future planning efforts described in the section below.
EHR.3) Address the global climate crisis here and now	Science staff will support the citywide climate initiative by updating our understanding of the latest regional, national and international data and trends affecting climate and begin modelling implications for the OSMP system highlighting areas of highest vulnerability. In the face of global heating, staff will also increase advocacy and education around protecting the ecological resources of the system, sequestering carbon, and inspiring collective action to address specific needs and opportunities on OSMP lands. See Table 4.1 for a more exhaustive list of potential programs and projects.
ATT.1) Reduce maintenance backlog for agriculture and water infrastructure	Our agricultural maintenance program will be integrated into our developing asset management system to track the facility condition index of agricultural and water infrastructure and identify priority work requirements.
ATT.2) Increase soil health and resilience	Staff will build on initial success to expand test sites for our soil health program that studies and enhances soil health.
ATT. 3) Address conflicts between agriculture and prairie dogs	Pursuant to City Council direction in 2019-2020, OSMP will evaluate possible lethal control of prairie dogs on certain irrigated OSMP lands. Staff will also explore projects that can consider changes to prescriptive grazing, vegetation restoration and non-native vegetation management to encourage faster recovery of vegetation in potential prairie dog relocation and agricultural restoration sites.

TIER 1: HIGH PRIORITY STRATEGY	EXAMPLE IMPLEMENTATION PROGRAMS OR PROJECTS
RRSE.1) Assess and manage increasing visitation	<p>Staff will continue visitor use management programs, such as:</p> <ul style="list-style-type: none">• Environmental education, including Leave No Trace principles (see CCEI.6);• Off-trail restrictions in Habitat Conservation Areas (see EHR.5);• Temporary muddy trail closures;• Temporary area closures to protect wildlife habitat and allow for restoration;• Volunteer, education and stewardship opportunities such as the Boulder Mountain Bike Patrol (see CCEI.7);• Parking fees at certain OSMP trailheads;• Chautauqua’s parking management and transportation program (see RRSE.4); and• Directing certain uses (i.e. horseback riding or mountain biking) to certain trails. <p>Staff will also update visitor use management guidance through a planning effort such as what is described in the section below.</p>
RRSE.2) Reduce trail maintenance backlog	Increasing focus on the routine and preventive trail maintenance program will reduce major maintenance over time. We will also continue developing our asset management systems to ensure the trail system is managed efficiently—tracking conditions to identify priorities, costs and innovations.
CCEI.1) Welcome diverse backgrounds and abilities	Staff will expand projects such as listening sessions to further understand the barriers to visiting open space and inform improvements to our system, such as including more information in other languages (see also CCEI.2 below).
CCEI.2) Enhance communication with visitors	Coordinated projects will improve wayfinding and interpretive signs to help improve compliance with regulations, create a sense of awe and understanding of open space, and improve accessibility to all community members (see CCEI.1 above). Staff will also increase the visibility of rangers, staff and volunteers out on the system.

Right: Photo by Ann G. Duncan

In addition to these action examples for Tier 1 strategies, the following program or project examples will contribute to our steady progress towards Tier 2 or 3 strategies:

- » Expanded Tall oatgrass weed management, where dense stands shade and out-compete native plants for light, moisture and nutrients (**EHR.6**);
- » Make infrastructure enhancements for more efficient water delivery such as sprinkler irrigation systems (**ATT.4**);
- » Best practices for design and construction that inspire high-quality trails, memorable experiences, environmental literacy and responsible behaviors, while also preparing the system for future extreme weather events (**RRSE.3**); and
- » Clear and sequential opportunities for youth to connect with nature over time through environmental education, nature play, stewardship and service learning (**CCEI.3**).

All of the strategies under the **Financial Sustainability** focus area have existing guidance from citywide policies and practices to support immediate implementation.



Implementation Framework for Future Planning

While many implementation initiatives have existing plan and policy guidance necessary to support immediate action, some new initiatives are more complex, requiring collaborative – and sometimes site-specific – decision-making through additional public engagement and consultation with the community, OSBT and City Council. Often these complexities stem from interrelationships between multiple focus areas, outcomes and strategies and the need to integrate multiple City Charter purposes for open space. In some cases, we have strategies that require planning guidance for areas in which we do not currently have sufficient guidance such as equity and climate crisis initiatives as well as water, scenic and cultural resource plans. Although incremental progress can be made in the short-term, *comprehensive implementation of these more complex strategies may be better driven by integrated planning efforts before beginning a full suite of programs and projects.*

For example, updating our visitor use management plan (as guided by **RRSE.1**) provides an opportunity to address and integrate all Master Plan focus areas. Since developing the 2005 Visitor Master Plan, visitation to OSMP has grown 34 percent, requiring an update to our management

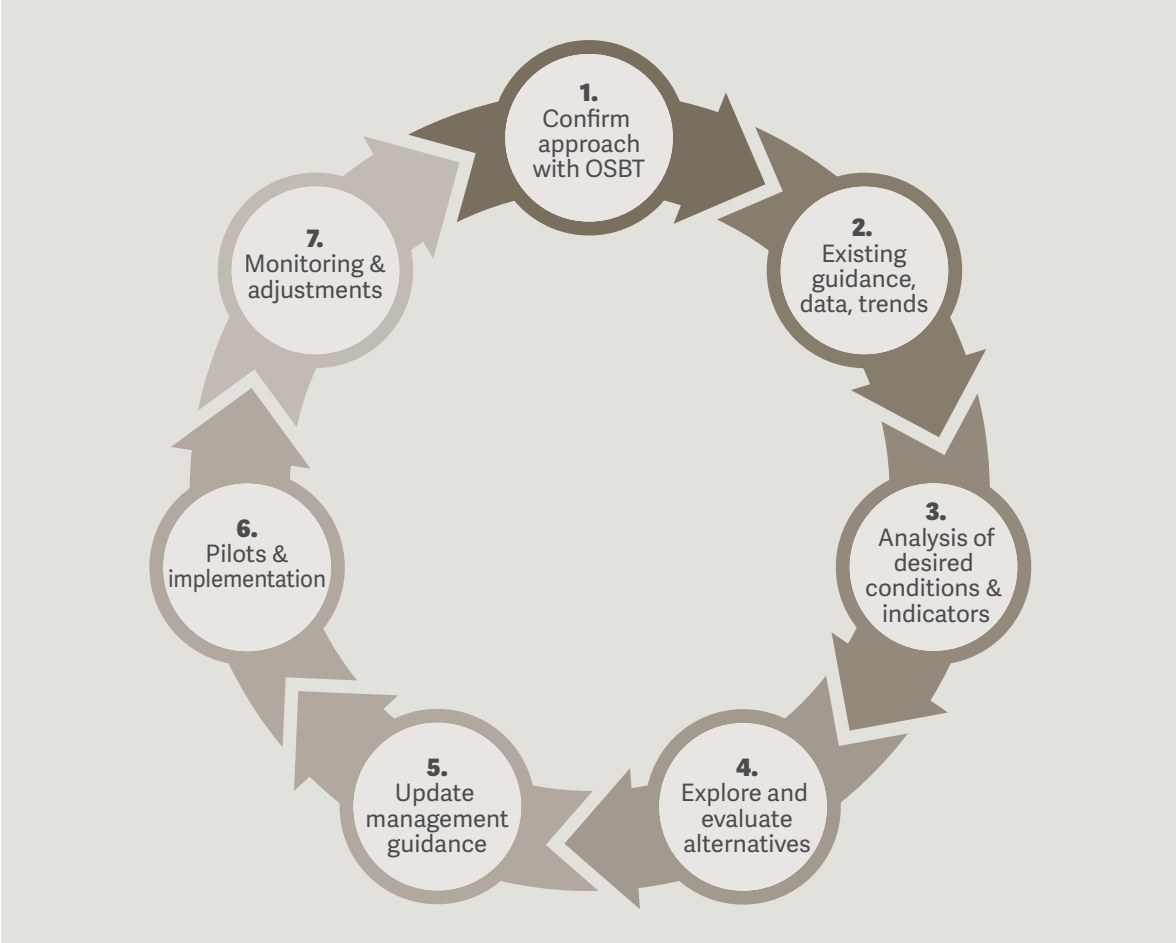
approach to address this trend and respond to shifting dynamics throughout our ecosystems, agricultural lands and communities. **Table 4.3** illustrates some initial examples of how that process would integrate across multiple strategies.

Planning for all charter purposes should also involve an adaptive management process (**Figure 4.2**) that encourages responsive, information-driven land management practices. This type of approach is critical to meet short-term needs and still provide a long-term vision that guides on-the-ground decisions. This approach will also build-in sound fiscal practices so that actions are closely tied to realistic funding levels for the department over the next decade. As we continue implementing this and other

Table 4.3: An Integrated Approach to Updating Visitor Use Management Guidance

FOCUS AREA	EXAMPLES OF HOW A VISITOR USE MANAGEMENT PLAN COULD INFORM FUTURE PROGRAMS AND PROJECTS
Ecosystem Health and Resilience (EHR)	<ul style="list-style-type: none">Where appropriate, preserving important habitat blocks and corridors through strategic trail alignments (EHR.1);On-trail requirements outside of Habitat Conservation Areas (EHR.5); andCriteria and best practices for managing undesignated trails (EHR.4).
Agriculture Today and Tomorrow (ATT)	<ul style="list-style-type: none">Preserving important agricultural landscapes (ATT.9); andBest practices for trails and access through working landscapes (ATT.9).
Responsible Recreation, Stewardship and Enjoyment (RRSE)	<ul style="list-style-type: none">Desired conditions and indicators for enjoyment and stewardship (RRSE.1);Specific locations that would benefit from updated approaches to managing use levels (RRSE.1);Best practices and priorities for improving the sustainability and resilience of trails and visitor facilities (RRSE.3);Coordinated multimodal solutions that support desired conditions (RRSE.4); andAppropriate passive recreational activities (RRSE.6).
Community Connection, Education and Inclusion (CCEI)	<ul style="list-style-type: none">Best practices and priorities for improving trails and facilities to better accommodate visitors of all backgrounds, abilities and ages (CCEI.1); andA coordinated approach to wayfinding and interpretive signs to help improve compliance and environmental literacy (CCEI.2 and CCEI.6)
Financial Sustainability (FS)	<p>As a fiscally constrained plan informed by improved asset management data, an update to the Visitor Master Plan through modules would provide and integrate systemwide guidance regarding:</p> <ul style="list-style-type: none">Trail and visitor facility conditions (FS.3 and FS.4); andPriorities for acquisitions that would support passive recreation (FS.5, FS.6, and FS.7).

Figure 4.2: Adaptive Management Process



planning processes, staff will follow citywide guidance related to engagement, including the creation of a public engagement plan that clearly defines when and how community engagement would occur throughout the process.

Updating components of the Grassland Ecosystem Management Plan (as guided by **EHR.2**) will also require an integrated, adaptive management approach to implementing Master Plan focus areas and strategies. Guidance in the following strategies, among others, would inform the update process and support robust implementation of the Master Plan as an

integrated whole:

- » **EHR.1) Preserve and restore important habitat blocks and corridors;**
- » **EHR.3) Address the global climate crisis here and now;**
- » **EHR.6) Control invasive species;**
- » **EHR.7) Develop a learning laboratory approach to conservation;**
- » **ATT.2) Increase soil health and resilience;**
- » **ATT.3) Address conflicts between agriculture and prairie dogs;**
- » **RRSE.1) Assess and manage increasing**

- » *visitation;*
- » **CCEI.6) Inspire environmental literacy and new involvement in OSMP;**
- » **CCEI.8) Heighten community understanding of land management efforts.**

The planning approaches described above will be further refined in consultation with the OSBT, as guided by strategy **FS.10: Update planning framework**. This strategy captures a commitment to refine OSMP’s planning process used to guide and deliver on-the-ground programs and projects. After Master Plan adoption, plans for specific areas of the OSMP system will integrate Master Plan strategies across focus areas and provide detail on how they will be implemented in specific locations. There has been a long tradition of area planning at OSMP, and the goal is to update this approach in consultation with OSBT in 2020.

After OSMP’s planning framework has been updated, future area plans will provide specific guidance on how to implement particular Master Plan strategies on the ground, the phasing of all actions in the plan, and a fiscally responsible approach that ensures implementation is tied to realistic funding levels. This may include developing specific management objectives for resources, trail regulations, and designs

for trailheads and farm sites. Coming out of area planning will be a phased program of work, supported by reasonable cost estimates to further inform staff work plans, funding requests, and grant applications. Strategies that would inform this area planning process are also those that would be further implemented by on-the-ground decision-making. They include:

- » **EHR. 1) Preserve and restore important habitat blocks and corridors;**
- » **EHR. 3) Address the global climate crisis here and now;**
- » **EHR. 4) Reduce undesignated trails;**
- » **EHR. 5) Extend on-trail requirements;**
- » **EHR. 6) Control invasive species;**
- » **ATT. 3) Address conflicts between agriculture and prairie dogs;**
- » **ATT. 4) Protect water resources in a warmer future;**
- » **ATT. 5) Encourage diverse and innovative agricultural operations;**
- » **ATT. 9) Enhance enjoyment and protection of working landscapes;**
- » **RRSE. 1) Assess and manage increasing visitation**
- » **RRSE. 3) Update guidelines and standards for trail design and construction;**
- » **RRSE. 4) Encourage multimodal access to trailheads;**
- » **RRSE. 8) Provide welcoming and inspiring visitor facilities and services;**
- » **CCEI. 1) Welcome diverse backgrounds and abilities;**
- » **CCEI. 2) Enhance communication with visitors;**
- » **CCEI. 3) Connect youth to the outdoors; and**
- » **CCEI. 8) Heighten community understanding of land management efforts.**

In addition, the Master Plan will also guide other future planning efforts, such as a water resources plan and a cultural resources plan. As the section below describes, these efforts will be integrated into staff work plans as funding and

staff capacity allow.

Implementation Process

Ultimately, our internal, multiyear work-planning process, our external budget approval process, and our periodic updates and engagements with the OSBT and City Council are guided by the Master Plan vision with the focus areas, outcomes and strategies informing our work over the next decade. Over the next ten years, staff will continue developing multiyear work plans and funding needs that align with and advance Master Plan guidance. This process will initially focus on Tier 1 strategies, by developing a coordinated suite of supportive programs, projects and planning efforts, as well as the phasing to complete them. It will also provide a broader outlook for Tier 2 and 3 strategies as capacity allows over the next decade. By describing and updating related funding needs each year, work planning will inform our annual budget approval process with the OSBT and City Council.

To illustrate how the Master Plan will inform our work-planning process, the following figure summarizes the example projects,

PROJECTS

- Lower Boulder Creek restoration (Tier 1)
- Climate change research and modeling (Tier1)
- Soil health test sites (Tier 1)
- Wayfinding & interpretive sign enhancements (Tier1)
- Inclusive listening sessions (Tier 1)



PROGRAMS

- Visitor use management programs (Tier 1)
- Maintenance for trails, agriculture and water (Tier 1)
- Tall oatgrass weed management (Tier 2)
- Upgrade water delivery infrastructure (Tier 2)
- Design and construction program enhancements (Tier 2)
- Continuum of youth engagement opportunities (Tier 2)



PLANS

- Grassland Ecosystem Management Plan update (Tier 1)
- Forest Ecosystem Management Plan update (Tier 1)
- Visitor Master Plan update (Tier 1)
- Area plans (integrative)



Figure 4.3: Example Implementation Actions

programs and plans previously described above. By doing so, it demonstrates the kind of internal coordination required to thoughtfully sequence, resource and fund these initiatives over the next decade.

Tracking Progress

The Master Plan describes goals for the community, staff, OSBT, Planning Board and City Council about how to manage the public’s lands into the future. To honor the importance of these goals and policy direction, staff will report annually on progress, showing the degree to which staff have advanced outcomes and achieved strategies. Reporting will describe progress simply and graphically for a broad audience. Staff will also communicate successes, challenges and proposed next steps and adjust long-term work plans and budgets in response to OSBT feedback. For example, in our efforts to **address the global climate crisis here and now (EHR. 3)** we will report on both practical actions we have implemented as well as longer-term planning on what is needed.

We will also continue to use research, monitoring, and the best available science and data to describe trends and respond adaptively to manage OSMP. We will rely on indicators developed through past system plans, using an integrated approach to reporting progress towards achieving Master Plan strategies. For example:

- » As we continue assessing the health of our native grasslands and forests, we can evaluate and adjust our approach to **preserve and restore important habitat blocks and corridors (EHR.1)**. Conservation

targets and indicators have been established in OSMP’s Grassland Ecosystem Management Plan and for resources in the forested foothills through the Forest Ecosystem Management Plan and West TSA plan.

- » Similarly, community surveys will help us understand how well we are doing to **assess and manage increasing visitation (RRSE.1.)** or **connect youth to the outdoors (CCEI.3)**. OSMP’s Visitor Master Plan established a framework for assessing visitor counts and perceptions.
- » Monitoring soil conditions in grasslands, farms and ranches will measure progress toward **increasing soil health and resilience (ATT.2)**. OSMP’s Ag Plan and Grassland Plan include supporting metrics.

As staff track and communicate our status, we will also gather input from the community to determine the effectiveness of programs and projects that advance Master Plan strategies.

Annual OSBT engagement on Master Plan implementation progress would support the budget approval process and include:

- » Review of accomplishments for the past year as well as progress updates on multiyear initiatives;
- » Preview of future initiatives; and
- » Priorities for the annual budget request in support of Master Plan implementation.

This approach will ensure the OSMP Master Plan reflects the living system we steward, adaptively guiding how we maintain, improve and act in transformative ways to deliver on the City Charter purposes for open space.

As we move forward over the next decade this

living plan will continue to reflect the community’s goals well into the future and through the approval process for the department’s work planning and budget, OSBT and City Council will have annual opportunities to review and discuss

progress.

land management over the next decade and beyond.

Coming Together to Care for Our Lands

Once approved, the **OSMP Master Plan** will be a guiding compass for department work, setting the course for identifying improvements, overcoming differences, respecting all voices, and achieving a shared vision for integrated, responsible

Like the process of discovering nature, developing a connection and understanding the value of protecting it, and then sharing the appreciation of it with others, every management action we take is part of a continuous cycle of collective efforts to explore, develop a shared understanding, and take action. None of us is alone in the shared responsibility of protecting critical habitat, enjoying connections with nature, or of sharing what we know about nature to inspire its careful stewardship. Rather, we are all stronger together, united around a central purpose of caring for nature, both for its inherent values and for the benefit of current and future generations. Our journey together continues.



APPENDIX A COMMUNITY ENGAGEMENT PROCESS

"The outdoors is for all and it is more empowering when we create opportunities and support one another's voices, welcoming each other into our respective stories."

—José Gonzales, Founder of Latino Outdoors

Left: Photo by Phillip Yates

Introduction

Time and again, Boulder residents have come together to support their natural lands through tax measures, volunteerism, planning processes, and so much more. This kind of meaningful, inclusive engagement is essential for future protection and enjoyment of our lands. Boulder's Open Space and Mountain Parks (OSMP) Department is committed to welcoming and involving all members our community, including youth, Spanish speakers, people experiencing disabilities, and other underserved populations.

As a pilot project for the City of Boulder's Engagement Strategic Framework, the process to develop the OSMP Master Plan was designed to help community members collaborate in an informed and predictable way.

To develop and evaluate the approach to engagement, city staff has worked with an OSMP Master Plan Process Committee. Made up of two members of City Council (Aaron Brockett and Mary Young), as well as two members of the Open Space Board of Trustees (Curt Brown and Tom Isaacson), the committee guided staff on creating and implementing an inclusive, transparent process for both community and staff engagement.

This appendix summarizes that two-year process, which began in August 2017 with the development of a project management plan (PMP). Council approved the PMP in January 2018, and the full engagement and planning process began soon thereafter.

A Foundation of Information

The Master Plan process launched in January 2018 with the release of the [System Overview report](#). This report and the strategic plans, reports, and scientific papers that

have guided OSMP over the years act as a foundation for understanding our system and its legacy. This foundation of information grounds the Master Plan work in decades of OSMP research.

Building An Inclusive Community

Guided by the Process Committee, the OSMP Master Plan process sought to invite all people, regardless of their differences, to work together and create a rich, diverse environment of involvement, respect, community and connection. This approach to inclusive engagement – cultivating broader community support and greater credibility – is a cornerstone of the Master Plan approach. Inclusive engagement makes for a better Master Plan because the challenges facing our lands are complex. Strong strategies for the future require input from as many perspectives as possible.

To create an inclusive process, OSMP staff collaborated with partners on outreach efforts called micro-engagements. These in-person methods reached people where they were – trailheads, libraries, housing communities, or conferences – rather than expecting them to come to us. This shift has allowed the department to think more critically about reaching a broader cross-section of our community, building deeper understandings of all who contribute to the stewardship and enjoyment of OSMP land.

Throughout the engagement process, OSMP staff enhanced existing partnerships and created new relationships with audiences of diverse backgrounds. Staff reached out to Spanish speakers, people experiencing disabilities, and youth to gather feedback. These efforts included engagements with more than 1,250 youth, 40 people experiencing disabilities, and 140 people from the Latinx community. We developed and worked with our partners to host inclusive events that anticipated and overcame barriers to participation.

With guidance from the Process Committee, we have:

- » Engaged members of the public where they typically go, in addition to inviting them to traditional community workshops;
- » Fostered relationships with underrepresented groups;
- » Partnered with Growing Up Boulder (GUB) and the Youth Opportunities Advisory Board (YOAB) to engage with youth;
- » Partnered with El Centro AMISTAD to engage with Spanish speakers and the Latinx community;
- » Coordinated with several organizations to engage with people experiencing disabilities; and
- » Made translation services and assistive devices available at workshops.

How We Listened

Thousands of individuals were intentionally and thoughtfully heard through five distinct engagement windows (Figure A.1) to help build clear, collective agreements about the future of OSMP. In total:

- » Members of the public submitted more than 10,000 comments;
- » OSMP staff hosted seven community events and two drop-in listening sessions with a combined total of more than 900 attendees;
- » Staff engaged over 1,400 people who are not typically heard from during engagement processes, including members of the Latinx community, people experiencing disabilities and youth; and

- » More than 1,300 individuals completed and returned a mailed statistically valid survey in spring 2019.

In January 2018, the **First Engagement Window** kicked off with an open house followed by a celebratory event that sought to engage all ages and aspects of the community around their values and the future of OSMP. This engagement window included creative feedback opportunities, including a community art project. Local musicians Jeff and Paige performed at this event, entertaining children and parents alike ([What We've Heard, 2019](#)). Micro-engagements also kicked-off in the First Engagement Window. These engagements focused on engaging underrepresented

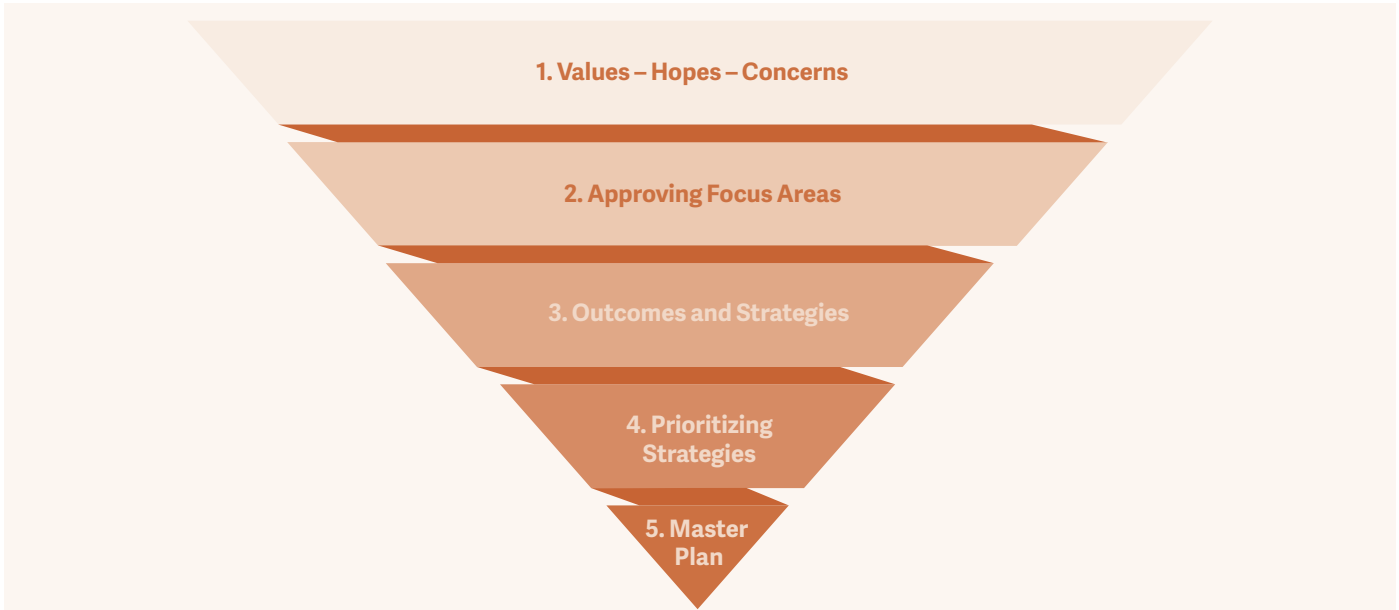


Figure A.1: Engaging the community through five distinct engagement windows.

groups through partnerships and channels they are already involved in. We concentrated on listening to community values, hopes, and concerns for the future of open space. Draft focus areas and values emerged from this community input, answering the question “What is it time to focus on now?”

Confirmation of these high-level focus areas occurred in the **Second Engagement Window** through an online questionnaire. City Council then approved these five focus areas in July 2018.

OSMP staff conducted a series of three public workshops in an iterative process that sought input from staff, stakeholders, and the community during the **Third Engagement Window**. We shared focus area research and trends at these meetings to support brainstorming around preliminary outcomes and strategies for four of the five focus areas. Online questionnaires also reached those not able to attend these workshops. A series of study sessions with OSBT guided refinements to these outcomes and strategies. The fifth focus area covers financial sustainability and was included in the subsequent engagement window.

After more than a year’s worth of consensus-building, the **Fourth Engagement Window** focused on funding and prioritization across the first four focus areas. During this window, the community provided valuable

input and guidance on which strategies the department should prioritize over the next decade. For the first time, all outcomes and strategies for the first four focus areas were shared together to support prioritization, along with draft outcomes and strategies to advance financial sustainability. Through a public workshop and micro-engagements, community members helped prioritize how their tax dollars for OSMP will be spent over the next decade. A statistically valid survey was mailed to 6,000 households in the Boulder area and a companion version of the survey was also available online for the general public.

With the goal of gaining City Council approval of the final OSMP Master Plan in September 2019, the purpose of the **Fifth Engagement Window** was to gather community feedback on the draft Master Plan. This feedback helped staff understand how well community concerns and aspirations have been reflected in the draft plan and what refinements were needed prior to its finalization and approval. Opportunities to share feedback included an online comment form, drop-in listening sessions with staff, and public comment at the June 12th OSBT meeting.

What We Heard

Through all five engagement windows, the longstanding community values of enjoying and protecting nature rang loudly through the thousands of public comments received. Love for the land, often passed down through generations, has created a strong and lasting heritage of environmental stewardship, outdoor recreation, and working landscapes. This legacy has united community members, staff, OSBT and Council around a shared set of open space values that are inherent in both the City Charter and the OSMP Master Plan. Full analyses of the input received during each of the five engagement windows can be found in the [relevant engagement summary reports](#). Below are some of the themes that emerged from each of the engagement windows.

Feedback from about 2,000 people around community values, hopes and concerns, gathered during the **First Engagement Window** confirmed that Boulder’s open space City Charter purposes are still extremely relevant today. When asked why OSMP is important via a questionnaire the top three items identified as topics of interest by respondents were “connections with nature, visitor facilities and enjoyment, and natural resources.” From this and similar feedback received through micro-engagements, public events, and online opportunities, five focus areas and supporting value statements emerged that reflect the individual and collective strength of those original City Charter purposes.

A total of more than 450 responses to an online questionnaire during the **Second Engagement Window** demonstrated overall support for the focus areas. Sixty percent of questionnaire respondents indicated that they agreed or strongly agreed that the five focus areas were the right management themes to guide OSMP, with an additional 25 percent reporting neutrality. Respondents were also asked to evaluate each focus area according to how important it is for the future of OSMP. These results demonstrated even stronger support for each focus area, with each of them perceived to be fairly important, important or very important.

During the **Third Engagement Window** community members submitted more than 2,650 written responses through online and print questionnaires, social media and emails, and on sticky notes at a series of community workshops. The goal of this engagement window was to gather community feedback on the preliminary outcomes and strategies developed to support four of the focus areas based on previous community and staff feedback, existing OSMP policies, and best practices in open space land management. Financial Sustainability, the fifth focus area, was included in the subsequent engagement window. The following themes emerged as important from public feedback according to each of the four focus areas:

FOCUS AREA	THEMES
Ecosystem Health and Resilience	<ul style="list-style-type: none">• Conservation of open space and wildlife• Wildlife and species introduction• Fire• Education• Volunteers• Impacts to the natural environment from visitor use
Agriculture Today and Tomorrow	<ul style="list-style-type: none">• Local food systems• Habitat preservation and ecological integration• Water rights, in-stream flows, and irrigation• Partnerships• Resilient future• Education
Responsible Recreation, Stewardship and Enjoyment	<ul style="list-style-type: none">• Variety of visitor experiences, including bike connections and dog-walking opportunities• Sustainable trails and facilities• Trail maintenance• Increasing visitation• Connections with nature• Inclusion
Community Connection, Education and Inclusion	<ul style="list-style-type: none">• Skill-building• Education• Volunteers• Inclusion• Partnerships• Youth• Indigenous populations• Historic preservation

In the **Fourth Engagement Window**, community members helped prioritize the strategies for the first four focus areas and refine outcomes and strategies for the final focus area, Financial Sustainability. Over 4,000 community residents informed draft funding priorities and budget targets through input provided via a public workshop, a statistically valid survey, an online open participation survey, and micro-engagements.

Across all focus areas, the community generally emphasized the need to take care of what we have, placing less emphasis on new acquisitions or trails. Input has also confirmed the primary importance of ecosystem health and resilience, as well as community values supporting recreation and connections with open space.

In both community surveys, at a community workshop, and through in-person micro-engagements staff asked community members the following question:

City staff must consider competing priorities to develop a budget for OSMP management. What if it were up to you? With \$5 increments being the smallest amount you might use, if you had \$100 to spend, how would you allocate those funds across the 10 management activities below?

Those management activities and the results are presented below in two formats:

- 1. **Table A.1** compares the average allocation of funds for each activity.
- 2. **Figure A.2** illustrates relative importance of each activity using findings from the statistically valid survey only.

For both, the top three activities are shown in color to demonstrate both the variety and similarity of findings across engagement platforms.

Table A.1: Average Allocation by Engagement Platform with Top Three in Orange for each Engagement Platform (2019 OSMP Master Plan Survey)

	COMMUNITY WORKSHOP	ALL MICRO-ENGAGEMENTS	STATISTICALLY VALID SURVEY	OPEN PARTICIPATION SURVEY
Restoring degraded ecosystems and wildlife habitat.	\$17.20	\$15.91	\$16.43	\$15.34
Maintaining and improving trails and visitor amenities.	\$15.00	\$9.77	\$15.67	\$18.73
Providing education, outreach and volunteer programs.	\$4.50	\$9.03	\$7.04	\$6.57
Engaging underserved communities, including the Latinx community and those experiencing disabilities.	\$9.10	\$10.70	\$6.65	\$5.03
Reducing visitor impacts to the natural environment in light of increased visitation trends.	\$12.30	\$8.84	\$9.61	\$10.79
Developing youth opportunities to spend more time in nature.	\$6.50	\$8.26	\$6.87	\$5.96
Maintaining and improving the condition of OSMP ranches and farms.	\$11.40	\$6.39	\$6.14	\$5.92
Acquiring more open space.	\$8.90	\$7.57	\$15.01	\$17.33
Researching and monitoring open space resources and trends.	\$7.80	\$7.54	\$5.92	\$5.38
Preparing for extreme weather events like flooding, fire and drought.	\$7.20	\$10.43	\$10.72	\$9.04

Figure A.2: Relative Importance of Management Activities with Top Three in Rust-Colored Boxes (2019 OSMP Master Plan Survey)



In total, community members consistently ranked the following two activities highly:

- » restoring degraded ecosystems and wildlife habitat; and
- » maintaining and improving trails and visitor amenities.

These findings are consistent with the level of importance residents assigned **Ecosystem Health and Resilience** and **Responsible Recreation, Stewardship and Enjoyment** respectively.

In addition, the following activities also emerged as important to residents:

- » acquiring more open space;
- » preparing for extreme weather events;
- » engaging underserved communities, including the Latinx community and those experiencing disabilities; and
- » reducing visitor impacts to the natural environment in light of increased visitation trends.

The survey also asked questions about certain topics in several ways to help staff and decision makers understand more depth and nuance in residents’ preferences. For example, while residents ranked acquisitions third most important in the \$100 question, another question asked residents to help staff balance needs related to both conservation of existing lands and acquisition of new ones (**Figure A.3**). In this case, residents placed more emphasis on improving ecosystem health on existing lands over acquiring new lands. Together, these findings suggest that it is important to both continue our acquisition program and to emphasize the care and maintenance of all lands we own and acquire.

The purpose of the **Fifth Engagement Window** was to gather feedback on the Draft Master Plan. Input from approximately 110 individuals or organizations was submitted via an online comment form, community

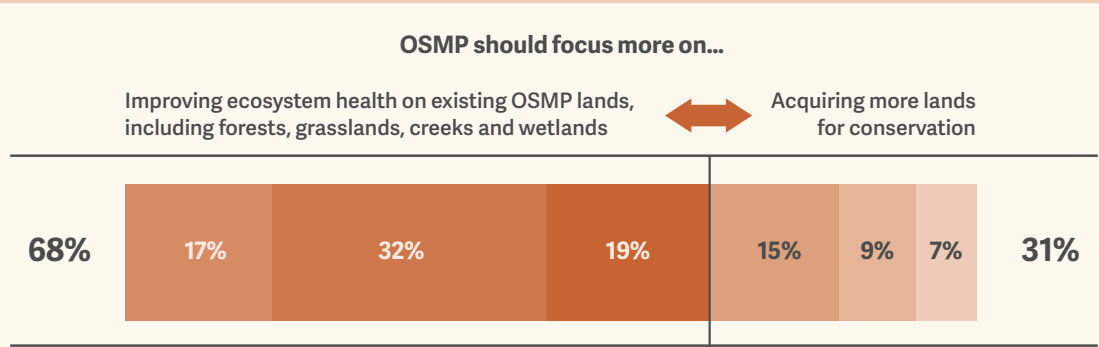
listening sessions, emails to staff, OSBT and Council, social media, and public comment at the June 12th OSBT meeting. This feedback confirmed consistent themes heard throughout the process and validated the ways in which they had been addressed in the draft plan.

Themes included:

- » Gratitude for an inclusive engagement process;
- » Suggestions to adjust overall structure or outline;
- » Suggestions to pull through or reference data and graphics from [System Overview Report](#) and other sources; and
- » Suggestions to refine priorities.

These suggestions informed the development of the Final Master Plan.

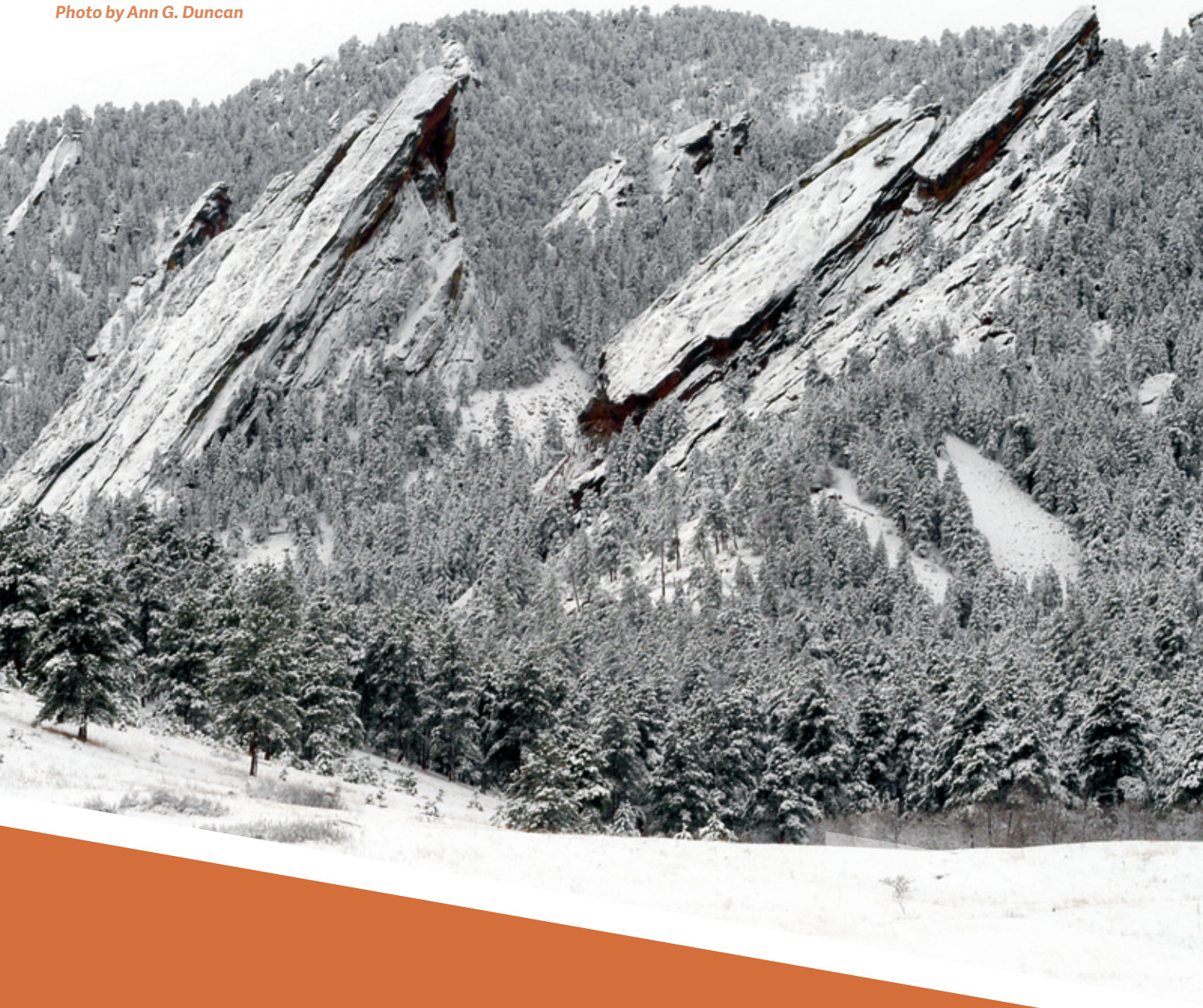
Figure A.3: Resident Preferences on Balancing Conservation of Existing Lands with Acquiring New Ones to Conserve (2019 OSMP Master Plan Survey)




Please note that the following pages (249-253) may not be accessible to screenreaders or other assistive devices. If you require an accessible version of these pages, please reach out to a member of the Open Space and Mountain Parks Department staff.

The 'Snapshot of 2019 Master Plan Survey Results' lists each question of the survey and the percentage of participants who chose each answer. The survey had a total of 1,331 respondents.

Photo by Ann G. Duncan



APPENDIX B
SNAPSHOT OF
2019 MASTER PLAN
SURVEY RESULTS



Open Space and Mountain Parks **FINAL** Master Plan
FOR COUNCIL REVIEW | September 2019

APPENDIX B: SNAPSHOT OF 2019 MASTER PLAN SURVEY RESULTS

City of Boulder - Open Space and Mountain Parks 2019 Master Plan Survey

n = 1299

1. On average, how often have you visited Open Space and Mountain Parks (OSMP) areas during the past 12 months? (Please see the map on the front page to identify the areas owned and/or managed by OSMP. You can also see a map online at bit.ly/osmpmap)

☐ Never→go to question #3 3%

☐ 1 to 3 times a year 9%

☐ Once a month 17%

☐ 2 to 3 times a month 20%

☐ Once a week 17%

☐ 2 to 3 times per week 23%

☐ Daily/almost daily 11%

n = 1283

2. Of the following activities, which TWO do you most frequently participate in when visiting OSMP areas?

☐ Hiking/walking 85%

☐ Dog walking 26%

☐ Running 27%

☐ Biking 26%

☐ Observing nature/wildlife 24%

☐ Photography/painting 6%

☐ Horseback riding 1%

☐ Climbing/bouldering 8%

☐ Fishing 3%

☐ Picnicking 5%

☐ Skiing/snowshoeing 4%

☐ Contemplation/meditation 9%

☐ Social gathering 7%

☐ Other: 1%

n = 1293

3. What are the things that keep you from visiting OSMP areas more often? (Please check all that apply.)

☐ Nothing, I visit OSMP often→go to question #4 38%

☐ Health or mobility issues 6%

☐ I don't feel welcome 1%

☐ I don't feel safe 2%

☐ OSMP areas are too crowded 20%

☐ Not sure how to find out about OSMP and how to access nature 4%

☐ Other: 2%

☐ I don't know where OSMP lands are 4%

☐ Lack of time in my life to visit 32%

☐ The trails don't match the activities I like to do 4%

☐ The amenities aren't family-friendly 0%

☐ My family likes to do other things 4%

☐ Not easy to get there by bus, bike or walking 9%

4. In July 2018, City Council approved five themes to focus OSMP management over the next decade. To what degree is each important for the future of Boulder's open space system? Which TWO are most important?

	Absolutely Essential	Very important	Somewhat important	Not at all important	Highest importance (Choose only 2)
n = 965 Ecosystem Health and Resilience	1 74%	2 20%	3 4%	4 1%	<input type="checkbox"/> 79%
n = 975 Responsible Recreation, Stewardship and Enjoyment ...	1 58%	2 32%	3 7%	4 2%	<input type="checkbox"/> 67%
n = 1016 Agriculture Today and Tomorrow	1 15%	2 34%	3 43%	4 9%	<input type="checkbox"/> 10%
n = 1000 Community Connection, Education and Inclusion	1 21%	2 41%	3 32%	4 7%	<input type="checkbox"/> 17%
n = 1013 Financial Sustainability	1 26%	2 45%	3 26%	4 3%	<input type="checkbox"/> 25%

5. How much of a problem, if at all, do you think crowding or parking congestion are at each of the following locations? (Please see map on the front page to identify these locations, or see a map online at bit.ly/osmpmap) Please think about each separately. (For crowding, think about on or along trail corridors, while parking conditions are at or near the parking lot(s)/trailhead.)

	Crowding				Parking congestion			
	A large problem	A small problem	Not at all a problem	Don't know	A large problem	A small problem	Not at all a problem	Don't know
n = 1250 Chautauqua	1 59%	2 29%	3 6%	4 5%	1 73%	2 18%	3 3%	4 7%
n = 1209 Sanitas	1 32%	2 35%	3 11%	4 22%	1 41%	2 26%	3 7%	4 25%
n = 1160 Bobolink	1 3%	2 17%	3 22%	4 58%	1 6%	2 17%	3 16%	4 60%
n = 1164 Doudy Draw/South Mesa	1 8%	2 23%	3 25%	4 44%	1 15%	2 19%	3 19%	4 47%
n = 1169 Wonderland Lake	1 4%	2 18%	3 30%	4 48%	1 5%	2 18%	3 24%	4 53%
n = 1148 Flatirons Vista	1 4%	2 15%	3 22%	4 60%	1 5%	2 14%	3 18%	4 63%
n = 1160 Boulder Valley Ranch	1 1%	2 10%	3 29%	4 61%	1 2%	2 12%	3 22%	4 63%
n = 1182 Gregory Canyon	1 11%	2 22%	3 21%	4 46%	1 23%	2 19%	3 9%	4 49%
n = 1172 Marshall Mesa	1 4%	2 23%	3 19%	4 54%	1 6%	2 22%	3 17%	4 56%
n = 418 Other	1 4%	2 9%	3 14%	4 73%	1 6%	2 7%	3 12%	4 76%

• This survey instrument has been annotated with results from the scientific survey only, not the online, open participation survey.

• The total number of survey respondents was n = 1331. Each question is annotated with the number of respondents that completed the question.

SNAPSHOT OF 2019 MASTER PLAN SURVEY RESULTS

OSMP.ORG

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6. On a case-by case basis, OSMP is considering managing high visitation in certain areas through the following approaches. In these circumstances, to what extent would you support or oppose the following actions?

		Strongly support	Support	Oppose	Strongly oppose	No opinion/ Don't know
n = 1287	Increasing education/outreach about trail etiquette.....	1 51%	2 41%	3 2%	4 1%	5 5%
n = 1301	Requiring dogs to be leashed on more trails.....	1 31%	2 25%	3 21%	4 13%	5 11%
n = 1268	Increasing enforcement and ranger patrols	1 18%	2 43%	3 18%	4 5%	5 15%
n = 1277	Widening, hardening or redesigning trails to support high visitation levels.....	1 16%	2 41%	3 23%	4 11%	5 9%
n = 1269	Charging for parking at more OSMP trailheads	1 10%	2 24%	3 33%	4 26%	5 6%
n = 1285	Providing low- or no-cost shuttles to trailheads	1 34%	2 46%	3 7%	4 5%	5 9%
n = 1283	Adding amenities to less frequented areas to disperse visitors across the system	1 21%	2 49%	3 11%	4 6%	5 13%
n = 1288	Separating uses such as hiking, biking and horseback-riding by time and/or place	1 18%	2 40%	3 21%	4 9%	5 13%
n = 1282	Closing trails for a period of time to protect wildlife and habitats....	1 29%	2 52%	3 8%	4 5%	5 6%
n = 1284	Closing OSMP parking lots when full and only letting cars in when someone leaves.....	1 13%	2 42%	3 23%	4 8%	5 14%
n = 1280	Requiring a reservation to access high demand areas during popular times.....	1 4%	2 15%	3 40%	4 34%	5 7%

7. New trails can be created when visitors try to reach destinations by going off trail or by using trails that are not officially managed by OSMP. In sensitive habitat areas, to what extent would you support or oppose OSMP closing unmanaged trails to better protect natural resources?

☐ Strongly support 47% ☐ Support 39% ☐ Oppose 8% ☐ Strongly oppose 4% ☐ Don't know 3%

8. In sensitive habitat areas, OSMP currently requires visitors to stay on trail or to seek a permit for allowable off-trail uses like educational research. To what extent would you support or oppose OSMP extending these requirements to stay on managed trails into targeted locations to better protect natural resources?

☐ Strongly support 44% ☐ Support 39% ☐ Oppose 6% ☐ Strongly oppose 3% ☐ Don't know 7%

9. City staff must consider competing priorities to develop a budget for OSMP management. What if it were up to you? With \$5 increments being the smallest amount you might use, if you had \$100 to spend, how would you allocate those funds across the 10 management activities below?

- \$ 15.67

Maintaining and improving trails and visitor amenities
- \$ 16.43

Restoring degraded ecosystems and wildlife habitat
- \$ 10.72

Preparing for extreme weather events like flooding, fire and drought
- \$ 7.04

Providing education, outreach and volunteer programs
- \$ 6.65

Engaging underserved communities, including the Latino community and those experiencing disabilities
- \$ 9.61

Reducing visitor impacts to the natural environment in light of increased visitation trends
- \$ 6.87

Developing youth opportunities to spend more time in nature
- \$ 6.14

Maintaining and improving the condition of OSMP ranches and farms
- \$ 15.01

Acquiring more open space
- \$ 5.92

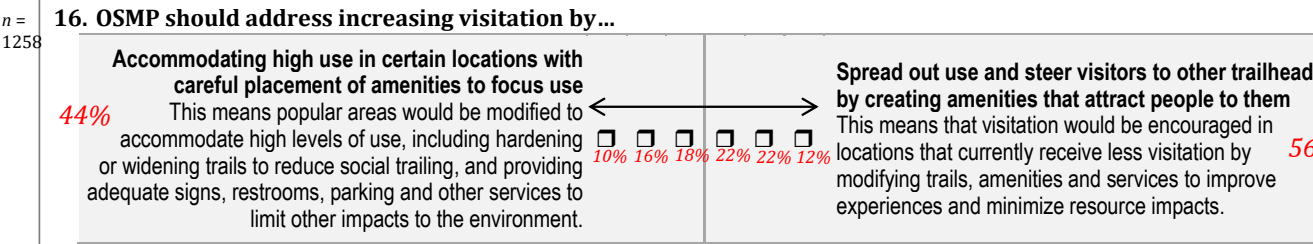
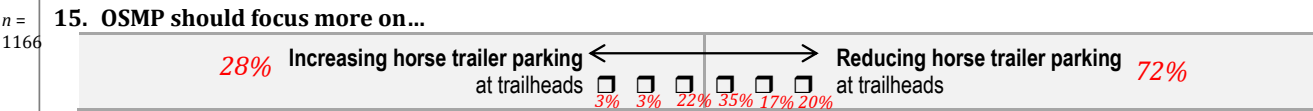
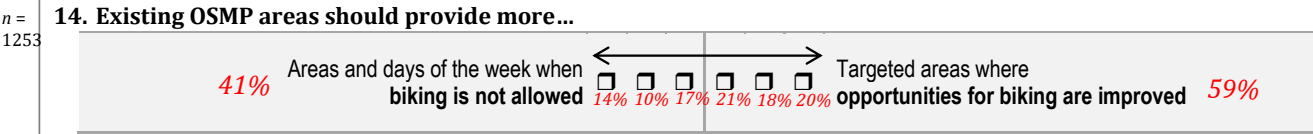
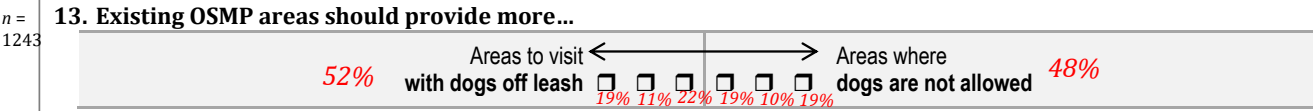
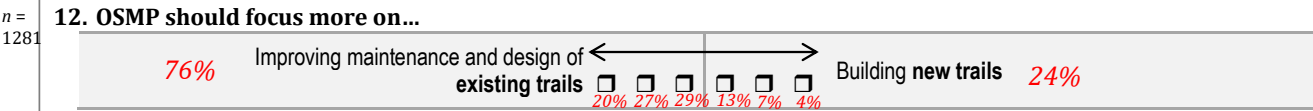
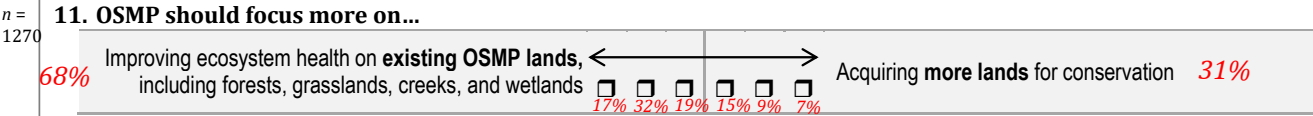
Researching and monitoring open space resources and trends

•This survey instrument has been annotated with results from the scientific survey only, not the online, open participation survey.
•The total number of survey respondents was n = 1331. Each question is annotated with the number of respondents that completed the question.

10. After 120 years of open space acquisitions, there is less land left for OSMP to acquire and protect. The lands that are left are also becoming more expensive. Therefore, OSMP must prioritize its approach to future acquisitions. How important are each of the following reasons for acquiring and protecting available land and related resources?

		Absolutely Essential	Very important	Somewhat important	Not at all important
n = 1289	To protect and connect high-quality habitat for plants and animals.....	1 59%	2 30%	3 10%	4 1%
n = 1295	To protect waterways such as floodplains, rivers, streams and wetland areas.....	1 61%	2 30%	3 8%	4 1%
n = 1274	To preserve water rights for native ecosystems and local agriculture.....	1 46%	2 39%	3 13%	4 1%
n = 1286	To limit oil and gas development.....	1 54%	2 22%	3 15%	4 9%
n = 1263	To preserve scenic areas or vistas.....	1 41%	2 37%	3 20%	4 2%
n = 1282	To protect ranches and farms from development	1 20%	2 37%	3 35%	4 7%
n = 1274	To support future trails and connect existing ones	1 30%	2 40%	3 26%	4 4%
n = 1288	To continue shaping Boulder's urban boundary with open space.....	1 26%	2 32%	3 31%	4 11%
n = 1259	To support future natural and agricultural corridors into the City	1 18%	2 37%	3 38%	4 6%

As OSMP considers potential management strategies for the future, trade-offs will have to be made. Please indicate how strongly you lean one way or the other for each pair of statements. For example, if you feel strongly about the statement to the right, check the box closest to that statement. If you lean slightly toward the statement on the left, check a box closer to the middle.



•This survey instrument has been annotated with results from the scientific survey only, not the online, open participation survey.
•The total number of survey respondents was n = 1331. Each question is annotated with the number of respondents that completed the question.

Continue my preferred activities on all days of the week, even though a mix of different activities may lead to conflicts between visitors ← → **Limit my preferred activities to certain days of the week to reduce the number of activities happening at the same time, even though this means giving up some of my options on a given day**

58% 21% 17% 20% 19% 14% 10% 43%

		Not at all <u>familiar</u>	<u>Familiar</u>	Very <u>Familiar</u>	<u>Expert</u>	Interested in <u>learning more</u>	<i>n</i> = 1277
<i>n</i> = 1273	Prairie dogs.....	1 22%	2 52%	3 22%	4 4%	<input type="checkbox"/> 30%	
<i>n</i> = 1273	Invasive weeds.....	1 35%	2 45%	3 16%	4 4%	<input type="checkbox"/> 30%	

1244

47% The tax would expire in 10 or fewer years

15% 12% 20% 17% 11% 24%

The tax did not expire 52%

252

- This survey instrument has been annotated with results from the scientific survey only, not the online, open participation survey.
- The total number of survey respondents was $n = 1331$. Each question is annotated with the number of respondents that completed the question.

☐ Less than \$25,000 15%
 ☐ \$100,000 to \$149,999 19%

☐ \$25,000 to \$49,999 16%
 ☐ \$150,000 or more 23%

☐ \$50,000 to \$99,999 26%

Photo by Dave Sutherland

APPENDIX C

SUMMARY OF
EXISTING GUIDANCE
BY STRATEGY

STRATEGY	SUMMARY
TIER 1	
EHR. 1) Preserve and restore important habitat blocks and corridors	Implementation of this strategy is most informed by OSMP guidance found in the “Best Opportunity Areas” in the Grassland Ecosystem Management Plan (2010) (Grassland Plan), the “Habitat Conservation Areas” and Appendix 4.1: Detailed Information on Management Areas in the Visitor Master Plan (2005) . The Forest Ecosystem Management Plan also includes specific management prescriptions (primarily thinning and prescribed fire) for forest stands along the urban/wildland interface. Trail Study Area Plans (2005-2016) include trail alignments, direction on closure/reclamation of undesignated trails, and seasonal protections for wildlife that integrate this strategy with Strategies RRSE. 6, 7 and 8 . The Acquisition Plan (2013) also prioritizes acquisition opportunities that protect large, intact habitat blocks, as well as riparian areas, wetlands and other areas of enhanced biological diversity.
EHR. 2) Update and continue implementing system plans guiding ecosystem management	The Grassland Ecosystem Management Plan (2010) , and Forest Ecosystem Management Plan (1999) and Agricultural Resources Management Plan (2017) are the existing OSMP guiding documents that would be updated as part of this strategy. OSMP has identified the need for a water resources management plan, and that plan would also be relevant to this strategy.
EHR. 3) Address the global climate crisis here and now	The most relevant OSMP guidance regarding the climate crisis is contained in the Forest Ecosystem Management Plan (1999) and Agricultural Resources Management Plan (2017) . The city’s Climate Commitment (2017) and the Boulder Valley Comprehensive Plan (2017) provide especially important context for this strategy.
ATT. 1) Reduce maintenance backlog for agriculture and water infrastructure	The Agricultural Resources Management Plan (2017) , and the Agricultural Operations target in the Grassland Ecosystem Management Plan (2010) provide guidance and strategies most relevant to the implementation of this strategy. OSMP has also identified the need for the development of water resources management guidance that would also support this strategy.
ATT 2) Increase soil health and resilience	The Agricultural Resources Management Plan (2017) and the Grassland Ecosystem Management Plan (2010) – especially the Agricultural Operations target - provide guidance and strategies most relevant to the implementation of this strategy.
ATT. 3) Address conflicts between agriculture and prairie dogs	The Grassland Ecosystem Management Plan (2010) and Agricultural Resources Management Plan (2017) contain OSMP’s current management objectives and strategies for the conservation of prairie dogs and agricultural operations. Management of prairie dogs is guided by the City’s wildlife protection ordinance , and Urban Wildlife Management Plan .

STRATEGY	SUMMARY
RRSE. 1) Assess and manage increasing visitation	The Visitor Master Plan (VMP) (2005) and the related Trail Study Area Plans (2005-2016) are the current OSMP guidance for managing visitation, with the VMP providing overarching guidance, and TSA Plans providing site-specific, on-the-ground strategies.
RRSE. 2) Reduce trail maintenance backlog	The Visitor Master Plan (VMP) (2005) – especially the services, policies and strategies of the Trails and Facilities Initiative – as well as the related Trail Study Area Plans (2005-2016) provide the most relevant guidance for this strategy.
CCEI. 1) Welcome diverse backgrounds and abilities	The Long Range Management Policies (1995) and the Visitor Master Plan (2005) contain guidance that supports this strategy. Citywide strategies also provide important guidance supporting this strategy including the Boulder Valley Comprehensive Plan (2017) , the Sustainability and Resilience Framework , especially the Healthy and Socially Thriving objective and the Engagement Strategic Framework (2017) .
CCEI. 2) Enhance communication with visitors	The Visitor Master Plan (2005) and the related Trail Study Area Plans (2005-2016) provide the most relevant guidance for the implementation of this strategy. The VMP provides guidance for signs and other communications across all seven of the plan's initiatives. TSA plans provide specific information about on the ground sign and communication needs.
TIER 2	
EHR. 4) Reduce undesigned trails	The Visitor Master Plan (VMP) (2005) considers how undesigned trails reflect patterns of desired visitor access. Both the VMP and the Grassland Ecosystem Management Plan (2010) offer guidance regarding the effects of the establishment and use of undesigned trails upon the sustainability of ecological systems, cultural resources, agricultural operations and provide strategies to reduce adverse effects. Trail Study Area Plans (2005-2016) provide site specific direction on which undesigned trails should be designated, re-routed and designated, or closed and reclaimed.
EHR. 5) Extend on-trail requirements	The Visitor Master Plan (VMP) (2005) guides OSMP to consider where off-trail activities that enhance the diversity of activities can be enjoyed on OSMP. Both the VMP and the Grassland Ecosystem Management Plan (2010) offer guidance regarding the resource effects of off-trail travel and provide a general approach to balancing enjoyment and resource protection. Trail Study Area Plans (2005-2016) provide site-specific direction and changes to the general direction in the VMP based upon resource sensitivity.
EHR. 6) Control invasive species	The Forest Ecosystem Management Plan (1999) , the Grassland Ecosystem Management Plan (2010) and the Agricultural Resources Management Plan (2017) are the OSMP plans providing the most direction for this strategy, and integrated pest management in general.

STRATEGY	SUMMARY
EHR. 7) Develop a learning laboratory approach to conservation	The Visitor Master Plan VMP (2005) , Forest Ecosystem Management Plan (1999) , Grassland Ecosystem Management Plan (2010) and Agricultural Resources Management Plan (2016) each identify important questions associated with monitoring and research or identify the potential use of OSMP lands to answer critical research questions to improve land management practices. The Trail Study Area Plans (2005-2016) also identify site-specific monitoring to inform management decision making as a part of trial or pilot strategies.
ATT. 4) Protect water resources in a warmer future	The Agricultural Resources Management Plan (2017) provides the greatest guidance specific to OSMP lands regarding this strategy. The city's Climate Commitment (2017) and the Boulder Valley Comprehensive Plan (2017) provide broader context and direction.
ATT. 5) Encourage diverse and innovative agricultural operations	The Agricultural Resources Management Plan (2017) and Grassland Ecosystem Management Plan (2010) provide the primary guidance including objectives and strategies related to this strategy.
RRSE. 3) Update guidelines and standards for quality trail design and construction	The Visitor Master Plan VMP (2005) contains descriptions of services, policies, and strategies directly related to this strategy in the Trails and Facilities Initiative. Trail Study Area Plans (2005-2016) have relied increasingly on internal best practices developed by staff in response to the VMP direction. Ecological Best Management Practices for Trail Planning and Design, Construction, Maintenance and Closure will also guide and inform guidelines and standards.
RRSE. 4) Encourage multimodal access to trailheads	The Visitor Master Plan VMP (2005) contains a policy similar to this strategy stating that OSMP will provide facilities and services to visitors to encourage their use of alternate transportation modes.
RRSE. 5) Manage passive recreation activities requiring an OSMP permit	The Visitor Master Plan VMP (2005) provides OSMP's current guidance related to fee-based recreation and commercial uses on OSMP. The VMP established the direction for the Voice and Sight program which is now carried out in accordance with the Boulder Revised Code especially 6-1-16 and 6-13 .
CCEI. 3) Connect youth to the outdoors	Prior to the OSMP Master Plan, the Visitor Master Plan (2005) (see the Education and Outreach Initiative) is the OSMP plan providing direction and guidance on connecting people with nature; however, there is no emphasis on youth. Implementation of general policy guidance has established and advanced many successful youth focused programs like the Junior Rangers/ Junior Ranger Naturalists and Meadow Music.
CCEI. 4) Support citywide engagement with federally recognized American Indian Tribes and indigenous peoples	The primary guidance for this strategy is the 2002 Memorandum of Understanding (MOU) signed by the City of Boulder and 13 American Indian Tribes and the 2002 MOU amendment to facilitate communication about cultural resources and to provide opportunities to hold traditional ceremonies requiring temporary structures – such as sweat lodges or tipis – on city-managed lands.

STRATEGY	SUMMARY
TIER 3	
EHR. 8) Reduce impacts from noise, light and nearby land uses	The Visitor Master Plan (VMP) (2005) , Grassland Ecosystem Management Plan (2010) , and Forest Ecosystem Management Plan (FEMP) (1999) provide background, objectives, and strategies aligned with this Master Plan strategy. The Trail Study Area Plans (2005-2016) describe site-specific actions integrating considerations from the Grassland Plan, FEMP and VMP.
EHR. 9) Reduce and offset OSMP greenhouse gas emissions	The Agricultural Resources Management Plan (2017) includes a section describing agricultural management strategies associated with climate change preparedness and includes OSMP guidance relevant to this strategy. The City of Boulder Climate Commitment (2017) and the Boulder Valley Comprehensive Plan (2017) provide broader scale guidance relevant to this strategy.
ATT. 6) Support the success of ranchers and farmers	The Agricultural Resources Management Plan (2017) and the parts of the Grassland Ecosystem Management Plan (2010) dealing with Agricultural Operations provide OSMP guidance most related to this strategy.
ATT. 7) Integrate native ecosystems and agriculture	The Agricultural Resources Management Plan (2017) has a section on Ecological Integration that is consistent with direction in the Grassland Ecosystem Management Plan (2010) which provides guidance for this strategy.
ATT. 8) Further reduce or eliminate pesticide use	The Agricultural Resources Management Plan (2017) and Grassland Ecosystem Management Plan (2010) provide the planning and policy guidance most related to this strategy.
ATT. 9) Enhance enjoyment and protection of working landscapes	This strategy is most supported by guidance from the Agricultural Resources Management Plan (2017) . The Acquisition Plan (2013) also guides acquisition opportunities that would support community services such as local agriculture.
RRSE. 6) Support a range of passive recreation experiences	This strategy is most supported by the Visitor Master Plan (2005) , including management area designations. The related Trail Study Area Plans (2005-2016) provide on-the-ground guidance for implementing the objective of maintaining a high quality visitor experience by supporting a diversity of recreational activities.
RRSE. 7) Build new trails as guided by past and future plans	Both the OSMP Visitor Master Plan (2005) and Acquisition Plan (2013) provide guidance that supports this strategy. The Trail Study Area Plans (2005-2016) identify areas where regional trail connections can be integrated as part of site-specific planning and initial design. The Boulder Valley Comprehensive Plan BVCP (2017) and the BVCP Trails Map provide broader scale guidance regarding regional trails planning.

STRATEGY	SUMMARY
RRSE. 8) Provide welcoming and inspiring visitor facilities and services	The OSMP Visitor Master Plan VMP (2005) contains guidance supporting this strategy as a key goal and guiding principle. Trail Study Area Plans (2005-2016) include strategies and site-specific recommendations related to this strategy.
RRSE. 9) Develop a learning laboratory approach to recreation	Research and monitoring to improve the visitor experience, the sustainability and design of trails and other facilities, as well as the effects of recreation on other OSMP purposes is a theme in the Visitor Master Plan (2005) and the related Trail Study Area Plans (2005-2016) .
CCEI. 5) Foster wellness through immersion in the outdoors	There is currently little direct OSMP policy direction related to this strategy. The Visitor Master Plan (2005) has a fundamental goal of providing high-quality recreation and education to foster visitor enjoyment, connections with the land, and a shared sense of stewardship, which indirectly supports this goal. At a broader level, the Boulder Valley Comprehensive Plan (2017) and the city's Sustainability and Resilience Framework provide guidance supporting this strategy.
CCEI. 6) Inspire environmental literacy and new involvement in OSMP	The Visitor Master Plan (2005) – especially the Education and Outreach initiative and the Agricultural Resources Management Plan (2017) provide high level guidance for this strategy; while the Trail Study Area Plans (2005-2016) provide some guidance on ways that this can be implemented through design and programming at a site-specific level.
CCEI. 7) Cultivate leaders in stewardship	The Visitor Master Plan (2005) identifies the need for enrolling community members in stewardship activities but does not specifically address developing leadership for the future. At a broader level, the Boulder Valley Comprehensive Plan (2017) and the city's Sustainability and Resilience Framework provide guidance supporting community stewardship in general.
CCEI. 8) Heighten community understanding of land management efforts	Both the Visitor Master Plan (2005) and the Agricultural Resources Management Plan (2017) have guidance that supports this strategy through policies, service descriptions and plan strategies to involve community members in stewardship projects.
CCEI. 9) Preserve and interpret Boulder's cultural heritage	The OSMP Visitor Master Plan (2005) , Agricultural Resources Management Plan (2017) and Cultural Resource Management Guidelines (1990) provide planning or policy guidance to support this strategy.



APPENDIX D
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Left: Adobe Stock Image

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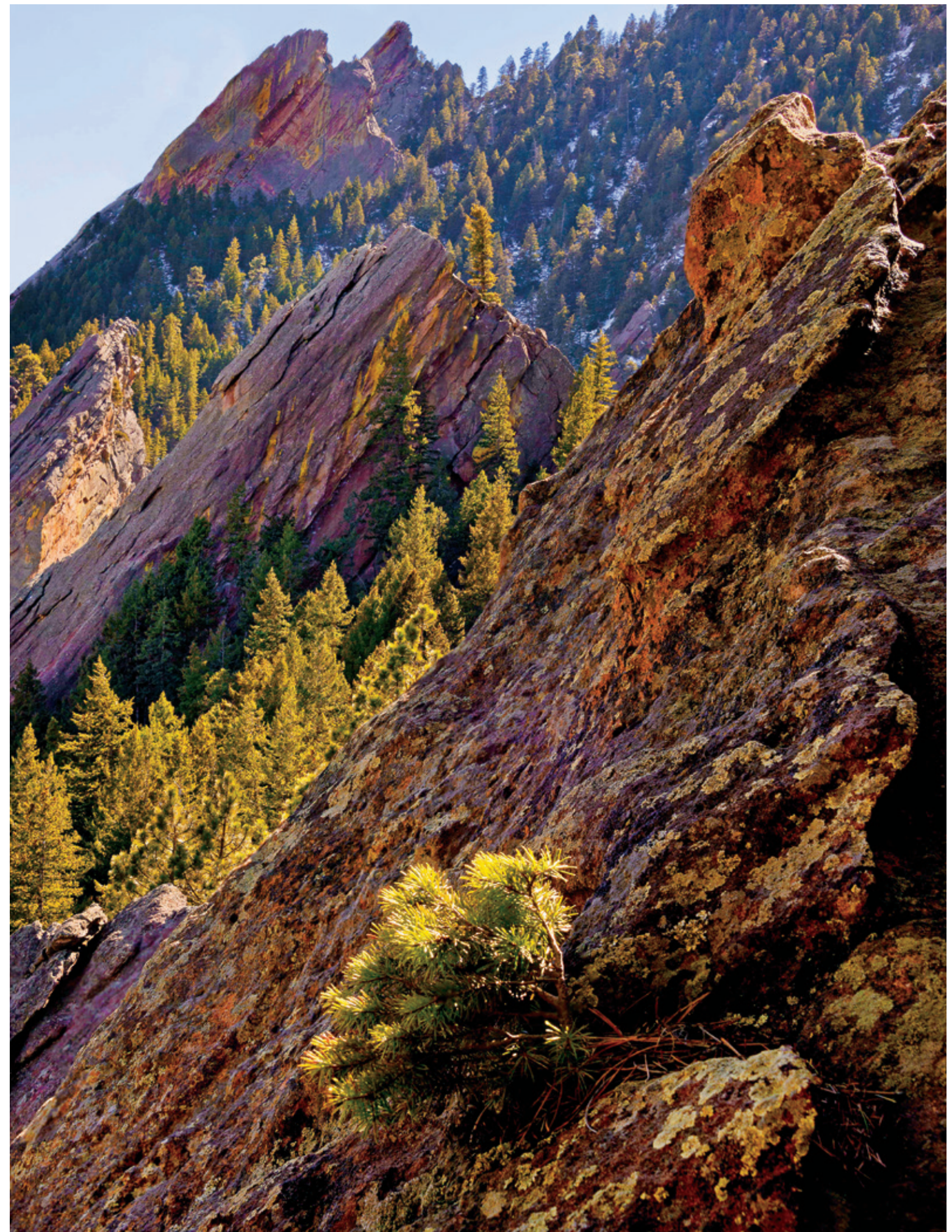
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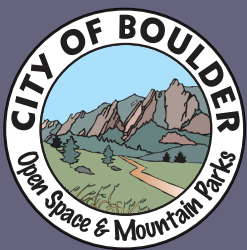
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