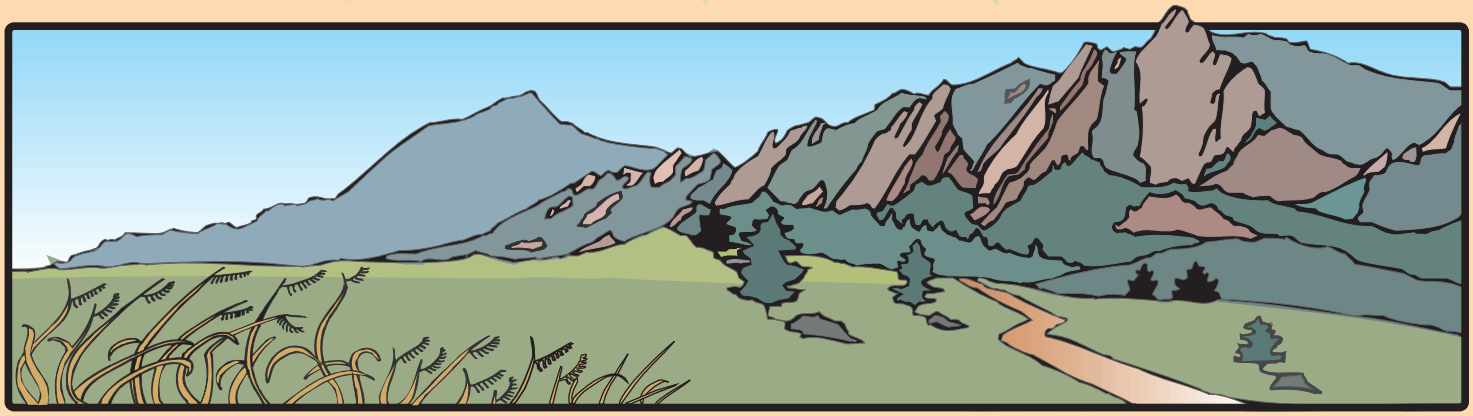
City of Boulder
OPEN SPACE & MOUNTAIN PARKS



VISITOR MASTER PLAN

ENJOY & PROTECT

APPROVED
APRIL 2005
www.osmp.org

Visitor Master Plan Acknowledgements

City of Boulder Open Space and Mountain Parks Department
Michael Patton, Director

City Manager
Frank Bruno

Boulder City Council
Mark Ruzzin, Mayor
Thomas Eldridge, Deputy Mayor
Suzy Ageton
Robin Bohannan
Crystal Gray
Shaun McGrath
Gordon Riggle
Andy Schultheiss
Jack Stoakes

Open Space Board of Trustees

Linda Jourgensen, Chair
Bruce Bland
Kenneth Dunn
Allyn Feinberg
Sean Kendall

Open Space and Mountain Parks Staff and Community Members
Staff of the Open Space and Mountain Parks Department and many community members gave countless and long hours contributing to the preparation and completion of the Visitor Master Plan. To one and all, for these substantial and essential contributions, our sincerest appreciation and thanks.

The Vision: What Our Visitors Will See, Do, and Know Tomorrow

Years from now, a hiker steps into Boulder Open Space and Mountain Parks--and steps into a world apart from the hectic pace of the city. She pauses to marvel at the vast natural spaces that are home to native plant and wildlife species. Chances are good that she might be walking through a tall grass prairie or along a foothills ridge, features uniquely preserved here at the junction of Colorado's Great Plains and Rocky Mountains. The sounds of footsteps are occasionally joined by a horse's clip-clop gait or the soft whirr of a bicycle's wheels. It is clear that the stewards of this land have done their jobs well. As she follows a trail into a nearby neighborhood, the hiker makes a mental note--"I'll come back soon."

The Open Space and Mountain Parks Visitor Master Plan is more than words on paper. It frames a vision of what Boulder's Open Space and Mountain Parks can offer visitors tomorrow and in perpetuity.

Implementing the Visitor Master Plan will create a land system where:

- Visitors access Open Space and Mountain Parks from conveniently located trailheads or from neighborhoods

- The first impression is one of the incredible beauty of Boulder's natural open lands, scenic vistas, and breathtaking mountain backdrop

- The superb condition of the land and visitor facilities reflects the commitment of Open Space and Mountain Parks staff, volunteers, and the public to care for and sustain our public lands for generations

- Visitors know immediately that Boulder's Open Space and Mountain Parks is a special place offering:

    - A refuge from the city and a chance to connect with nature
    - Wide open spaces with diverse plants and wildlife
    - Opportunities for solitude, introspection, nature study and appreciation, as well as adventure, challenge, and exercise
    - A place for hands-on land stewardship activities for those who care deeply about preserving and restoring natural landscapes
    - A wide range of non-motorized recreational activities, including hiking, horseback riding, bicycling, climbing, fishing, and others
    - An interconnected trail system with a range of challenge levels and access to hundreds of beautiful and interesting destinations
    - An environment that is safe for people to experience on their own terms
    - Camaraderie among visitors who choose to be considerate of each other and to walk softly on the land
    - A natural setting where native plants and animals can thrive

- Visitors are invited to participate in an ethic of protecting and conserving the natural environment while enjoying outdoor recreational opportunities

- Visitors find places where they have the freedom to explore

- Visitors can walk their dogs either leashed or under voice-and-sight control

- Visitors discover some areas that are managed as a refuge for wildlife and natural ecosystems, and where resource protection is emphasized

EXECUTIVE SUMMARY

The Open Space and Mountain Parks Visitor Master Plan will guide the Open Space and Mountain Parks Department for the next decade. Its overall purpose is to provide a framework for decisions that will ensure a continued high quality visitor experience, while at the same time ensuring that the lands are protected and preserved for future generations. The Plan provides the policy direction, management strategies, and investment programs that will accomplish this vision.

Enhance, Improve, Enjoy, Protect, and Partner

The Visitor Master Plan has four overall goals. These goals are the product of citizen advisory committees appointed by the Open Space Board of Trustees in 1999 and 2003 to advise the Open Space and Mountain Parks Program on the preparation of this Visitor Master Plan.

Goal 1: Enhance the experience

Maintain or enhance the quality of the visitor experience when engaged in passive recreational activities such as hiking, climbing, and bicycling.

Goal 2: Improve access

Provide and maintain highly functional and sustainable visitor facilities that support visitor access to appropriate destinations and add to the quality of their experience.

Goal 3: Enjoy and protect

Ensure that passive recreational activities and facilities are compatible with long-term protection of natural, agricultural, and cultural resources.

Goal 4: Partner with the community

Partner with the community in passive recreation decision-making and stewardship efforts.

Organization of the Plan

This Open Space and Mountain Parks Visitor Master Plan has five parts:

1. An overview of the current situation (Chapter 2)
2. The plan for the future (Chapter 3)
3. How the plan will be implemented (Chapter 4)
4. Monitoring the success of the plan (Chapter 5)
5. The financial plan (Chapter 6)

1. Current Situation: The Visitor Experience and What We Know

An important community asset, the Open Space and Mountain Parks system supports diverse, nationally recognized outdoor recreational opportunities in a spectacular and varied natural setting. Visitors to Open Space and Mountain Parks lands enjoy:

- More than 130 miles of maintained trails with many convenient access points throughout the city and county

- A diverse range of recreational and interpretive opportunities offered by the Open Space and Mountain Parks Program

Throughout the Plan's public involvement process, the public, as a whole, indicated that they were very satisfied with their experience when visiting Open Space and Mountain Parks lands. They felt that preserving the beauty and naturalness of Open Space and Mountain Parks lands was extremely important to the quality of the visitor experience. Although our visitors are satisfied with current recreational opportunities, their experience, and resource conditions on Open Space and Mountain Parks lands, they are concerned about the future--whether or not land management will be able to maintain the Open Space and Mountain Parks' positive attributes in the face of projected growth in visitor activities.

Recent information suggests that Open Space and Mountain Parks lands increasingly are a regional destination for the Denver metropolitan area and communities outside of Boulder County.

A tradition of unlimited access combined with growth in visits accentuates concerns about the future. Public concerns include the quality of the visitor experience, adequacy of trails and facilities, an increase in visitor conflicts, and compatibility with resource protection and preservation.

2. The Plan: Key Policies for the Future

The Visitor Master Plan is intended to maintain or improve the quality of visitor experience and ensure that Open Space and Mountain Parks natural values--which make this place special--are protected and preserved. The Plan presents the following guidance:

- Extend a sense of welcome to visitors that fosters their enjoyment and appreciation of Open Space and Mountain Parks' special resources
- Invest in improving and expanding the trails system to enhance visitor access
- Focus on visitor safety, maintenance of existing facilities, and resource protection
- Emphasize education to motivate low-impact visitor use techniques
- Use the least restrictive means possible to reduce visitor conflict and minimize impacts on the environment
- Involve the public in managing Open Space and Mountain Parks lands by providing varied ways to give input to decisions and volunteer opportunities that foster learning and stewardship
- Follow an adaptive management approach that involves monitoring the results of management programs and allows adjustments when necessary

3. Implementing the Visitor Master Plan: The Approach for Meeting Future Needs

Seven initiatives to maintain and improve visitor services are proposed in the Visitor Master Plan. Management strategies to implement the initiatives are outlined. They include both programmatic and capital projects. The initiatives include:

1. Education and outreach
2. Safety and enforcement
3. Recreational opportunities
4. Trails and facilities
5. Resource protection
6. User conflict reduction
7. Public involvement

Mechanisms to implement the strategies include a system of management areas, a monitoring system, a financing plan, and ways to build Open Space and Mountain Parks capacities to implement the shared vision.

4. Monitoring the Success of the Plan: How Are We Doing?

Monitoring the progress of the Plan's implementation is a key element of the Visitor Master Plan. Assessments of the success of our initiatives, management strategies, and implementation projects will be critical for subsequent planning and budgeting. Monitoring will allow Open Space and Mountain Parks to discover what works best in achieving the Plan's goals and modifying management actions as needed.

5. Plan Phasing and Financing: The Investment Program

Visitor Investment Strategy
The Visitor Master Plan presents three capital funding investment programs based on different levels of funding: **Current Funding, Accelerated Funding, and Identified Need**. These programs implement the policy direction of the Visitor Master Plan at different funding levels and set priorities for investments in visitor services.

Capital Improvement Program
A 6-year capital improvement project schedule is outlined in the Visitor Master Plan, identifying major capital expenditures. The priorities for capital expenditures are visitor safety, maintenance of the existing infrastructure (trails, trailheads, and facilities), elimination of the deferred maintenance needs for existing trails and facilities, and construction of new trails and facilities.

To meet these prioritized needs, additional funding is needed over the next ten years. Potential funding sources include state and federal grants, partnerships with funding entities, private funds, donations, and reallocation of anticipated revenue.

City of Boulder Open Space Charter
The management of Open Space and Mountain Parks lands is guided by the City Charter, as approved by the city of Boulder voters in 1986. The Charter provides a context for the Visitor Master Plan and its implementation.

Open Space and Mountain Parks Provisions in the City of Boulder Charter

Open Space and Mountain Parks land shall be acquired, maintained, preserved, retained, and used only for the following purposes:

- *Preservation or restoration of natural areas characterized by or including terrain, geologic formations, flora, or fauna that is unusual, spectacular, historically important, scientifically valuable, or unique, or that represent outstanding or rare examples of native species;*
- *Preservation of water resources in their natural or traditional state, scenic areas or vistas, wildlife habitats, or fragile ecosystems;*
- *Preservation of land for passive recreation use, such as hiking, photography or nature study, and if specifically designated, bicycling, horseback riding, or fishing;*
- *Preservation of agricultural uses and land suitable for agricultural production;*
- *Utilization of land for shaping the development of the city, limiting urban sprawl and disciplining growth;*
- *Utilization of non-urban land for spatial definition of urban areas;*
- *Utilization of land to prevent encroachment on floodplains; and*
- *Preservation of land for its aesthetic or passive recreational value and its contribution to the quality of life of the community*

Table of Contents

Acknowledgements inside front cover

The Vision: What Our Visitors Will See, Do, and Know Tomorrow I
Executive Summary II

Table of Contents VI
List of Plan Reference Documents VII
List of Appendices VII
List of Tables VIII
List of Figures VIII
List of Maps VIII

Chapter 1: Introduction: A Long-Range Plan for a Priceless Resource 1
Local Recreation in a National Setting 1
The Current Situation 1
The Future: Crowds and Conflicts? 2
Passive Recreation: What Is It? 2
Visitor Services Overview 3
Open Space and Mountain Parks--A Community Treasure for More Than 100 Years 4
Visitor Master Plan History and Direction 4
Long-Range Management Policies: Passive Recreation with Preservation 5
Relationship to Other Comprehensive, Master, and Resource Management Plans 5
Public Process and Citizen Advisory Committees 5
Visitor Master Plan Goals 6
Visitor Master Plan Review Process 7

Chapter 2: Context for the Visitor Master Plan 8
Facilities and Services 8
Land and Facilities for Passive Recreation 8
Visitor Services: For a Safe, Pleasant Experience 10
Keeping Visitors Safe 12
Environmental Resources 13
Open Space and Mountain Parks Staffing and Funding 14
Staffing 14
Current Open Space and Mountain Parks Funding 15
Assessment of the Current and Future Management Situation 19
Current Visitor Use Patterns and Trends: Greater Use, Today and Tomorrow 19
What's Working and What's Not: Potential Areas of Improvement Summary 21
Key Unmet Public Desires, Problems, and Opportunities: Relationship to Visitor Master Plan Strategies 23
Summary of Public Input on the Plan 25

Chapter 3: Planning Goals, Guiding Principles, Services, and Policies 28
Visitor Master Plan Goals 28
Guiding Principles 29
Visitor Master Plan Initiatives, Services, and Policies 30

Chapter 4: Visitor Master Plan Implementation 35
Education and Outreach Initiative 36
Safety and Enforcement Initiative 37
Recreational Opportunities Initiative 39
Trails and Facilities Initiative 40

Resource Protection Initiative 42
User Conflict Reduction Initiative 44
Public Involvement Initiative 46
Management Area: A Geographic Framework for Implementing the Plan 47
A Description of the Open Space and Mountain Parks Management Area Designations 47
Management Area Strategies 50
Policies 55
Management Actions 55

Chapter 5: Monitoring and Performance Measures 56
Monitoring 56
Monitoring, Performance Measures, and the Visitor Master Plan Initiatives 57
Education and Outreach Initiative 58
Safety and Enforcement Initiative 59
Recreational Opportunities Initiative 60
Trails and Facilities Initiative 61
Resource Protection Initiative 62
User Conflict Reduction Initiative 63
Public Involvement Initiative 64

Chapter 6: Funding and Scheduling 65
Investment Strategy 65
Current Funding Investment Program 66
Action Funding Investment Program 66
Identified Need Investment Program 66
Funding 67
Capacity-Building 67
Project Phasing for Plan Implementation 69

Visitor Master Plan References 73

List of Plan Reference Documents

List of Plan Reference Documents Available on the Open Space and Mountain Parks Website. 80

List of Appendices

1.1 Summary of Visitor Use Studies A-1
1.2 Guidance from Other Plans A-8
1.3 Public Involvement Process A-14
4.1 Detailed Information on Management Areas A-17

List of Tables

Table 1.1	Current Status of Recreational Activities on Open Space and Mountain Parks	3
Table 2.1	Open Space and Mountain Parks Work Group Involvement in Supporting Visitor Services and Facilities	14
Table 2.2	Sales Tax Financing of the Open Space Fund	15
Table 2.3	Allocation of City of Boulder Lottery Funding (2002 to 2007)	16
Table 2.4	Denver Regional Population Forecast by Regional Statistical Area	19
Table 2.5	Key Unmet Public Desires, Problems, and Opportunities: Relationship to Master Plan Strategies	23
Table 4.1	Management Strategies for Open Space and Mountain Parks Management Areas	50
Table 4.2	Management Areas Designations and Management Areas on Open Space and Mountain Parks	54

List of Figures

Figure 1.1	Key to Trailhead Numbers (including facility matrix)	following pg. 2
Figure 2.1	Open Space and Mountain Parks Lands and Access	8
Figure 2.2	Example Comparison of Designated and Undesignated Trails	11
Figure 2.3	Boulder Open Space and Mountain Parks Revenues for 2005 (2005 Approved Budget)	16
Figure 2.4	Open Space and Mountain Parks Expenditures (2005 Approved Budget)	18

List of Maps

Map 1.1	Open Space and Mountain Parks Lands, Trails, and Trailheads	following pg. 2
Map 4.1	Open Space and Mountain Parks Trail Study Area	following pg. 42
Map 4.2	Open Space and Mountain Parks Trail Reconstruction and Critical Road Crossings	following pg. 42
Map 4.3	Open Space and Mountain Parks Priority New Trails and Improvements	following pg. 42
Map 4.4	Open Space and Mountain Parks Trailhead and Trail Access Improvements	following pg. 42
Map 4.5	Open Space and Mountain Parks Management Areas	following pg. 48
Map 4.6	Open Space and Mountain Parks Dog Management Designations	following pg. 48

Chapter

1

Introduction: A Long-Range Plan for a Priceless Resource

Boulder's 43,000 acres of Open Space and Mountain Parks are a community investment in natural lands and resources--for the visitors of today and tomorrow. This Visitor Master Plan is a long-range view for serving the community's needs and expectations concerning the management and protection of this priceless investment. The Plan contains goals, objectives, policy guidance, and strategies and investment programs that the city and community intend to accomplish by the year 2015.

A major part of managing the city's natural lands portfolio is providing diverse and meaningful opportunities for enjoyment and fun (recreation), as well as solitude, contemplation, and inspiration. The Visitor Master Plan presents a framework that defines how we can continue to provide high quality recreational experiences while protecting and preserving significant natural areas and valuable habitats for native plants and animals.

Local Recreation in a National Setting

Visitors to our Open Space and Mountain Parks lands find an incredible array of passive recreational opportunities amidst a beautiful landscape of mountains and prairies. Here, visitors value time spent outdoors and the chance to connect with the area's natural and agricultural heritage.

The Current Situation

As an important community asset, the Boulder Open Space and Mountain Parks Program supports a variety of nationally recognized outdoor recreational opportunities in a spectacular and diverse natural setting. Visitors enjoy approximately 130 miles of maintained trails served by more than 60 major access points (see Map 1.1 and Figure 1.1). An estimated 1.8 million visits took place during the summer (June, July, and August) of 2004. A year-long visitation study will be completed by Open Space and Mountain Parks in 2005 to update our visitation counts.

We Like Our Lands and Recreation

Based on surveys of Boulder residents, visitors enjoy the many recreational opportunities offered by the Open Space and Mountain Parks Program. In 2004, residents surveyed indicated that they were very satisfied with their experience, with 96% of respondents reporting that they considered the quality of their experience to be good or excellent. A similar percentage of visitors considered the trail facilities on Open Space and Mountain Parks lands to be excellent or good (90%). When asked about the management balance between recreation and preservation, 68% said the balance is "about right." Of those who felt the balance was wrong, about the same number said there was too much emphasis on recreation as those who said there was too much emphasis on environmental preservation. A summary of visitor use studies, including public surveys, is included in Appendix 1.1.

Boulder's Open Space and Mountain Parks lands have a tradition of "open access." They have also experienced recent rapid growth in visits. This combination accentuates concerns about the future of these lands, including:

- Future quality of the visitor experience
- Adequacy of the visitor trails and facilities
- Compatibility with resource protection

The Future: Crowds and Conflicts?

Although most visitors are satisfied with recreational opportunities and resource conditions on Open Space and Mountain Parks lands, they are also concerned about future conditions. Almost 40% of 1999 survey respondents said that they thought conditions will be worse in 25 years. Specific concerns include crowded conditions, conflicts among different types of use, and impacts to vegetation and wildlife due to increased use. An ongoing study of visitation to Open Space and Mountain Parks lands will shed even more light on visitor perceptions of the future.

Addressing growth-related infrastructure needs, unmet desires for new trails and connections, and programs to protect environmental resources will require major funding and potential new sources of funding. The vulnerability of sensitive habitats to impacts and the need for increased protection continue to be major community concerns. Recent information suggests that, increasingly, Open Space and Mountain Parks lands are a regional destination for the Denver metropolitan area and out-of-county communities.

Passive Recreation: What Is It?

Passive recreation is identified as a purpose of the Open Space and Mountain Parks Program in the Boulder City Charter. Although the City Charter never precisely defines passive recreation, it does mention several "passive" recreational activities, including: hiking, nature study, and photography. Three other recreational activities are listed in the City Charter as appropriate passive recreation under certain conditions--bicycling, fishing, and horseback riding. Passive recreation is different from developed recreation in that passive recreation activities require minimal construction or development of facilities for the activity to be conducted.

The first Visitor Plan Advisory Committee crafted the following definition of passive recreation, which is used in the Visitor Master Plan.

Passive recreation is defined as non-motorized activities that:

- Offer constructive, restorative, and pleasurable human benefits that foster an appreciation and understanding of Open Space [and Mountain Parks] and its purposes
- Do not significantly impact natural, cultural, scientific, or agricultural values
- Occur in an Open Space and Mountain Parks setting, which is an integral part of the experience
- Require only minimal facilities and services directly related to safety and minimizing passive recreational impacts
- Are compatible with other passive recreational activities

In addition to defining passive recreation, the Visitor Plan Advisory Committee also developed a passive recreation activity assessment process to help determine what activities on Open Space and Mountain Parks are appropriate (City of Boulder 2000b; see Plan Reference Documents on the Visitor Master Plan page at www.osmp.org). This process utilizes a set of criteria and a methodology to guide decisions on what recreational activities will be considered passive and allowed, and what conditions should be placed on activities to minimize their impacts. For

example, an activity-specific condition might be allowing a particular use only on-trail or only at specially designated sites.

Open Space and Mountain Parks staff used the Visitor Plan Advisory Committee criteria and methodology to evaluate the most popular activities enjoyed by our visitors. Table 1.1 summarizes the current status of recreational activities on Open Space and Mountain Parks lands, with regard to the definition of passive recreation.

Table 1.1: Current Status of Recreational Activities on Open Space and Mountain Parks

Activities *not* considered passive recreation	**Allowed only in Specifically-Designated Areas or Sites**	**Allowed only on Designated Trails**	**Allowed on Open Space and Mountain Parks (OSMP) Lands**
These activities do not fit the criteria for passive recreation and therefore are not allowed on OSMP lands.	To provide high-quality recreation opportunities in locations that can handle the impacts, these activities are allowed only at appropriate sites.	To provide high-quality recreation opportunities in locations that can handle the impacts, these activities are allowed only on appropriate trails.	At current levels of use, these activities are generally compatible with OSMP visitor use and resource protection goals. The lower the impact, the greater degree of compatibility. Whenever possible, staying on-trail will minimize impact. In Habitat Conservation Areas, all visitor activities are required to be on-trail, unless approved under an off-trail permit.
Motorized vehicles Hunting Organized sports Paintball games Swimming (prohibited in lakes and ponds)	Fishing Wading Tubing, kayaking, canoeing Sledding Hang/paraglilding Bolted climbing Dog walking Camping (at 4th-of-July campground only) Swimming (in creeks only)	Bicycling Horse-drawn wagons or sleds Dog sleds Strollers/joggers In-line skates Wheeled boards (e.g., skateboards, mountain boards)	Hiking Trail running/jogging Wheel-chair use Nature study Photography Picnicking Horseback riding Traditional climbing/ bouldering Cross-country skiing Snowshoeing Model glider flying Geocaching Orienteering

Visitor Services Overview

Visitor services provided by the Open Space and Mountain Parks Program include environmental education, public outreach, law enforcement, emergency response, and trails and facilities. Services are designed to enhance the visitor experience, provide visitor safety, and protect the natural environment. Although citizen surveys reflect a high satisfaction level with visitor services, improvements are suggested in some areas. Citizens most frequently requested “more public

information" and "more enforcement." Ratings of interpretive, emergency response, and law enforcement services in the 1999 citizen survey were high. Ratings of facilities directly serving visitors, such as trails, parking lots, signs, and trash cans, were also high.

Open Space and Mountain Parks--A Community Treasure for More Than 100 Years

For the residents of Boulder, the Open Space and Mountain Parks Program is one of the defining characteristics of their community. It is a community treasure, an integral part of the community fabric, and a gift given by past and present generations to future generations. These lands are destinations for fun and enjoyment. They are also the last remnants of Boulder County's natural and cultural heritage.

Testimony to the vision of Boulder citizens for the past 100 years, the Open Space and Mountain Parks system is the result of the citizens' desire to preserve the natural beauty and ecological integrity of Boulder's setting. This century-old collective vision defined by the Boulder community has never lost focus. Over the years, Boulder citizens have consistently approved taxes to acquire and protect the Open Space and Mountain Parks lands around Boulder from further development and loss.

Management to Enjoy, Protect, and Preserve Our Legacy

A rapidly growing and urbanizing corridor along Colorado's East Slope and Front Range has dramatically altered the natural landscape in the past 30 years. Farms have become sprawling subdivisions and shopping malls, ranches have become ranchettes, and towns have blossomed into cities. As a result, our Open Space and Mountain Parks lands are visited by more and more people. This increase in use has resulted in a clear recognition of the need for a management framework to meet the Boulder community's expectations:

- *Recreational*--providing opportunities for visitors to enjoy and appreciate the lands they helped preserve
- *Scenic*--protecting the beautiful natural setting
- *Natural*--protecting the native plants and animals that live here and preserving their homes and natural communities
- *Historical and cultural*--continuing agricultural operations that historically made the Boulder Valley a productive contributor to the agricultural economy of Boulder County

This Plan focuses on the first of these expectations--providing opportunities for visitors--but recognizes the need to blend passive recreation with these other expectations.

Given the many challenges, the Visitor Master Plan strengthens how recreational uses on Open Space and Mountain Parks lands will be managed. The Plan is a framework for providing high quality passive recreation activities and the services to support them, while meeting community expectations for protecting and preserving the natural environment.

Visitor Master Plan History and Direction

In 1998, the Open Space Board of Trustees authorized the Open Space and Mountain Parks Program to prepare a Visitor Master Plan. This direction was based on several earlier actions or planning guidance previously approved by the Open Space Board of Trustees or the Boulder City Council. See Appendix 1.2 for a summary of other plans that provide guidance for the Visitor Master Plan.

Long-Range Management Policies: Passive Recreation with Preservation

> "*Open Space will be managed in a way that provides for aesthetic enjoyment, minimizes cumulative impacts to the natural systems and conflicts between users, considers user safety, preserves responsible agricultural use, provides for a quality recreational experience, and protects natural areas*."
>
> The Open Space Department's *Long Range Management Policies* (City of Boulder, 1995)

Since the quality of the visitor experience is highly dependent upon the quality of the natural environment and the amount of recreational use these areas receive, the focus of the Visitor Master Plan is to provide quality passive recreational experiences in areas that are compatible with preservation of the natural environment. Even passive recreational uses are discouraged, and sometimes prohibited, in areas that have high environmental values or where sensitive natural resources may be damaged by certain activities.

The Open Space Board of Trustees and the Boulder City Council approved the preparation of a Visitor Master Plan for Open Space and Mountain Parks through its review and approval of the *Long Range Management Policies* and annual approvals of the Program's budget.

Relationship to Other Comprehensive, Master, and Resource Management Plans

The Visitor Master Plan fits under the umbrella of the Boulder Valley Comprehensive Plan. It implements the broader vision contained in the Boulder Valley Comprehensive Plan for Open Space and Mountain Parks--to provide recreational opportunities to sustain the quality of life in the Boulder Valley while protecting the natural resources and native ecosystems found in the Boulder Valley.

Two area management plans approved by the Open Space Board of Trustees in 1997 (*North Boulder Valley Area Management Plan*) and in 1998 (*South Boulder Creek Area Management Plan*) evaluate the visitor experience and recreational use in specific open space areas. A general management plan was completed for the Boulder Mountain Parks in 1999 and adopted by the Open Space Board of Trustees in 2000 (*Boulder Mountain Parks Resource Protection and Visitor Use Plan*). The *Open Space Long Range Management Policies* were adopted by the Open Space Board of Trustees and City Council in 1995. The Visitor Master Plan is designed to be implemented in conjunction with natural resource management plans such as the Colorado Tallgrass State Natural Area Management Plan, the Open Space and Mountain Parks Forest Ecosystem Management Plan, and other plans yet to be developed.

Public Process and Citizen Advisory Committees

The public process for the Visitor Master Plan was extensive and included more than 60 meetings with the public and community interest groups from 1999 to 2005. Two public opinion surveys in 1999 and 2004 provided in-depth information on public attitudes toward issues addressed by the Visitor Master Plan (They can be found at the Visitor Master Plan website at www.osmp.org). In addition, hundreds of citizens took the time to submit comments in writing or over the internet. A summary of the public involvement process can be found in Appendix 1.3; a summary of the public comments on the Visitor Master Plan can be found in the Plan Reference Documents (available on the Visitor Master Plan page at www.osmp.org). Three different citizen groups provided recommendations for the Plan.

In 1999, a Visitor Plan Advisory Committee was formed to advise the Open Space and Mountain Parks Department about visitor use and passive recreation. Comprised of representatives of both recreation and environmental groups, the committee presented its report to the Open Space Board of Trustees in 2000. The *Visitor Plan Advisory Committee Report* (City of Boulder, 2000b)

recommends completing and implementing a Visitor Master Plan and identifies several guiding principles for developing the Plan.

A second citizen advisory committee was appointed by the Open Space Board of Trustees in 2003 to provide further guidance and recommendations on improving visitor experience and managing recreational land use. The report from the second Visitor Plan Advisory Committee was accepted by the Open Space Board of Trustees in 2003 (City of Boulder, 2003d).

After the first draft of the Plan was released in April 2004, Open Space and Mountain Parks worked with a "roundtable" group of stakeholders to review the Plan. This Community Group Forum included a wide spectrum of recreational, environmental, and community groups. The Forum evaluated the Visitor Master Plan from the different perspectives and developed a report with consensus recommendations for plan changes that bridge between the different values and interests (City of Boulder, 2004d). The Forum's recommendations, along with the reports of the two Visitor Plan Advisory Committees, can be found on the Visitor Master Plan page at www.osmp.org. The Plan incorporates many of the recommendations offered by citizens, the Visitor Plan Advisory Committees, and the Community Group Forum.

Visitor Master Plan Goals

The principal goals for the Visitor Master Plan were developed by the Visitor Plan Advisory Committees. Management strategies and monitoring projects presented in this Plan are designed to accomplish these goals. The monitoring projects are designed to measure success in attaining these goals. Detailed information about these goals, and the objectives, principles, and policies that support them, can be found in Chapter 3.

Goal 1: Enhance the experience

> **Maintain or enhance the quality of the visitor experience when engaged in passive recreational activities such as hiking, climbing, and bicycling.**

Goal 2: Improve access

> **Provide and maintain highly functional and sustainable visitor facilities that support visitor access to appropriate destinations and add to the quality of their experience.**

Goal 3: Enjoy and protect

> **Ensure that passive recreational activities and facilities are compatible with long-term protection of natural, agricultural, and cultural resources.**

Goal 4: Partner with the community

> **Partner with the community in passive recreation decision-making and stewardship efforts.**

To achieve these goals, the Visitor Master Plan proposes to implement specific strategies that enhance, focus, and guide visitor activities. These implementation strategies are based upon the philosophy that: (1) people are a part of the "urban interface" natural lands managed by Open Space and Mountain Parks; (2) people need to experience nature in order to appreciate and value it; and (3) experiencing nature requires being outside in nature.

Visitor Master Plan Review Process

The Open Space and Mountain Parks Visitor Master Plan was adopted by the Open Space Board of Trustees on February 23, 2005 and recommended to the Boulder City Council. The Plan was reviewed by the Planning Board on March 17, 2005 with regard to consistency with the Boulder Valley Comprehensive Plan and the city's Capital Improvements Program. The Plan was reviewed and unanimously accepted by the Boulder City Council on April 12, 2005.

The citizens of Boulder have built the Open Space and Mountain Parks Program during the past 107 years. The Visitor Master Plan calls for continuing this vital and vibrant relationship between the Program and the citizens of Boulder--a partnership that is essential for sustaining Open Space and Mountain Parks lands over the long term.

The Visitor Master Plan will be reviewed periodically by the Open Space Board of Trustees, and updated and revised at least every five years using an adaptive management approach and the best available information.

Chapter

2

Context for the Visitor Master Plan

Why is the Visitor Master Plan needed? What is the rationale for the management strategies and actions contained in the Plan? How will area trends affect Open Space and Mountain Parks lands? What do visitors think about their Open Space and Mountain Parks? Chapter 2 summarizes: the Open Space and Mountain Parks Program funding, facilities, and services; visitor use patterns and trends; current and anticipated conditions for visitor experience, visitor infrastructure, and resources; and public input on the Visitor Master Plan to date. Later chapters will describe the strategies proposed to address these issues.

Facilities and Services

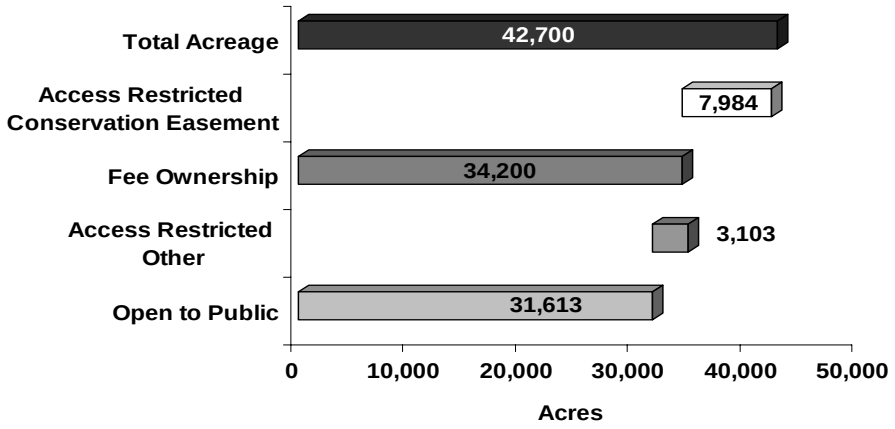
Land and Facilities for Passive Recreation

Lands

Open Space and Mountain Parks has acquired about 43,000 acres, nearly 32,000 acres (72%) of which is currently open to public use (Figure 2.1).

Approximately 8,000 acres (19%) were acquired as development rights or conservation easements. Those lands remain in private ownership. Properties with conservation easements or development rights are not open to the public, unless a trail or public use easement has been negotiated with the landowner. Approximately 3,000 acres (7%) of land owned are currently closed to protect visitors from potential hazards, or to protect sensitive resources.

Figure 2.1: Open Space and Mountain Parks Lands and Access



Facilities

Facilities at a Glance

- 32 designated trailheads with over 900 parking spots
- 75 designated access points
- 24 picnic areas

A variety of facilities are found on Open Space and Mountain Parks lands, all of which are important in helping Open Space and Mountain Parks meet the goals of this Visitor Master Plan. Purposes of facilities include keeping visitors safe, promoting enjoyment, providing access, reducing the aesthetic impact of litter and pet waste, and protecting other resources. Facilities are also used to minimize operational and maintenance costs. In addition to trails and trailhead parking lots, Open Space and Mountain Parks facilities include visitor centers, picnic areas, scenic overlooks, and fishing piers.

Trailheads and Access Points

Trailheads offer vehicle parking and convenient access to designated trails. Most trailheads also provide trash cans and information about how to use the area responsibly. Other trailhead amenities may include bike racks, restrooms, dog waste bag dispensers, picnic tables, benches, piers, bridges, and signs. **Access points** simply provide access to designated trails.

Trailhead Facilities Maintenance. Open Space and Mountain Parks staff routinely maintains trailheads and access points. Maintenance includes routine repairs due to normal wear and tear, vandalism, trash removal, mowing, cleaning of restrooms, filling potholes, painting, and sign repairs. Trailhead maintenance also includes snow removal at some popular trailheads.

Over 130 Miles of Maintained Trails

There are more than 130 miles of designated trails (i.e., trails which are signed, shown on public trail maps, and maintained) in the Open Space and Mountain Parks system. Typically, trails have a natural tread or soft surface of crushed rock or gravel. Approximately five miles of concrete or asphalt trails traverse Open Space and Mountain Parks. The majority of these trails were built and are maintained by others, such as the city's Greenways Program.

Currently, 41 miles (or about one-third) of the trail system are open to bicycles. Most bicycle trails are east of State Highway 93/Broadway. The entire trail system is open to pedestrians and equestrians.

Trails are maintained year-round, with most of the work done in the spring, summer, and fall. Junior Rangers (young men and women aged 14 to 17) do much of the routine annual maintenance. Open Space and Mountain Parks trail staff work with maintenance contractors and seasonal adult trail crews to address more difficult or larger-scale maintenance and construction projects.

Undesignated Trails: Where People and Animals Make Their Own Paths

In addition to the system of designated trails, there are approximately 300 additional miles of "undesignated" trails. Undesignated trails have been created or worn into the landscape by visitors repeatedly walking off of designated trails. Sometimes, undesignated trails begin as wildlife or cattle trails that attract the interest of hikers or other visitors. Many of the undesignated trails are in the mountain backdrop.

Undesignated trails can significantly damage a landscape. Repeated trampling, soil compaction or destabilization, and loss of litter, humus, and topsoil pose severe threats to plants and plant communities. Since vegetation is the primary stabilizing influence in a landscape, vegetation loss can result in serious erosion. The undesignated trails on Open Space and Mountain Parks lands

are among the greatest contributors to vegetation loss and soil erosion. In several areas, extensive networks of undesignated trails have formed, ranging from single paths to undesignated trails that resemble "spider webs" of interconnecting trails. See Figure 2.2 for an example of extensive undesignated trails in the Chautauqua area.

Unlike a state or national park, where most visitors enter through formal access points, much of the 340 mile perimeter of Open Space and Mountain Parks is open to pedestrian access. Undesignated trails arise more easily in this "open" land system. Although Open Space and Mountain Parks strongly discourages use of undesignated access points and undesignated trails, they are convenient to use and many people do not recognize the impact caused by such use.

Other Facilities: Nature Center to Picnic Shelters

The Open Space and Mountain Parks main offices at Cherryvale Road and our website (www.osmp.org) provide maps, directions and answers to a wide range of questions about Open Space and Mountain Parks lands and facilities. The Chautauqua Cottage is staffed daily during spring, summer, and fall, and on weekends during the winter. The Flagstaff Summit Nature Center is open weekends during the summer.

The Flagstaff Summit area has large picnic shelters and an open-air amphitheater, which can be reserved for weddings or other family gatherings and community events.

Visitor Services: For a Safe, Pleasant Experience

Open Space and Mountain Parks provides programs and services to deliver a high quality visitor experience. Safety, access to destinations, an aesthetically pleasing setting, and low levels of user conflict are stressed. In addition, some visitor services are aimed at maintaining the sustainability of the visitor facilities, while other services contribute to the conservation of natural, cultural or agricultural resources.

Visitor services include environmental education and community outreach, emergency response, law enforcement, and facility construction and maintenance.

Education and Outreach

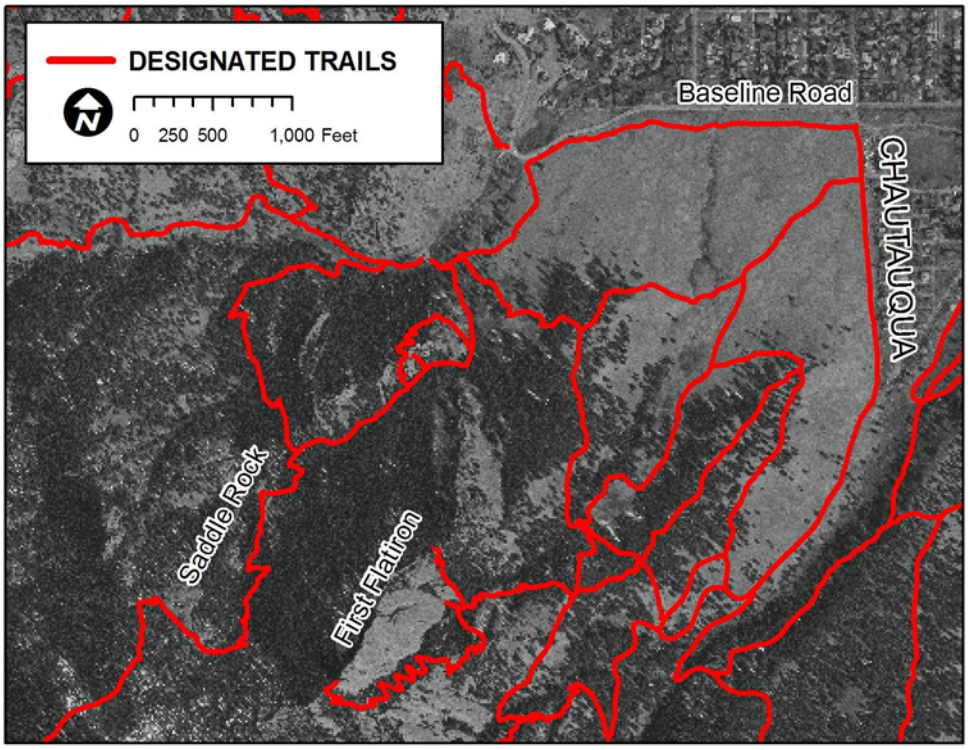
The Open Space and Mountain Parks Program has traditionally provided opportunities for visitors to deepen their appreciation of the landscape and cultivate responsibility for care of the land.

Staff and volunteers conduct environmental educational programs for civic groups, neighborhood organizations, schools, and others. Public "theme" hikes and nature walks are offered throughout the year. In 2004, 241 educational programs were presented, reaching about 6,800 people.

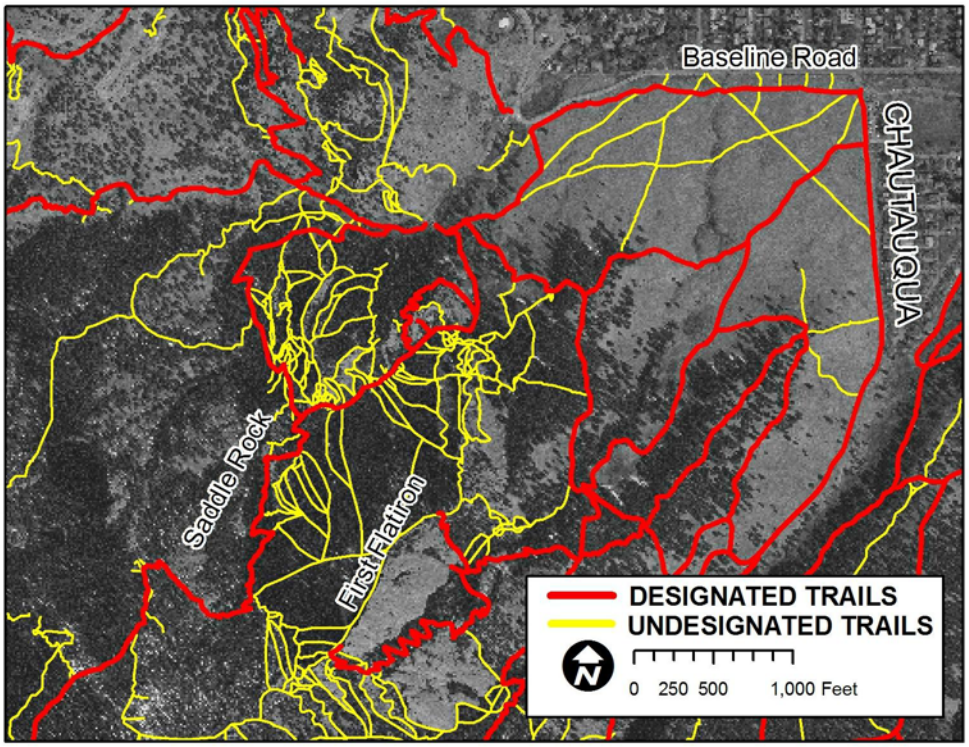
Open Space and Mountain Parks outreach complements educational programming by sharing similar messages in the community in a variety of settings such as the Boulder Farmer's Market or Boulder Creek Festival, at trailheads and on the trails. In 2004, such events accounted for over 120,000 contacts with citizens and visitors. Patrol by rangers also provides a daily outreach presence throughout the system. The majority of ranger contacts provides information and encourages responsible visitor behavior.

Figure 2.2: Example Comparison of Designated and Undesignated Trails
Aerial photography of an area in the vicinity of Chautauqua Meadow
A: Designated Trails Only
B: Designated and Undesignated Trails

A



B



The types of information provided by Open Space and Mountain Parks include:

- Trails and visitor opportunities
- Appropriate recreational activities
- Nature education about geology, wildlife, plants, and ecological communities
- Notification of bear and mountain lion activity
- Fire danger
- Trail construction activity
- Leave-No-Trace techniques

Leave-No-Trace

Open Space and Mountain Parks provides a safe haven for wild plants and animals and a welcome break from our work-a-day lives. By recreating wisely and using Leave-No-Trace practices, visitors can minimize impact on wildlife and fellow visitors while enjoying their experience even more. Leave-No-Trace consists of six simple principles for use in a front-country outdoor recreational setting:

- Manage your dog
- Stick to trail
- Pick up poop
- Share our trails
- Trash your trash
- Leave it as you find it

Other educational and outreach tools. Various materials and media tools are used to support education and outreach efforts, including brochures, trailhead information boards, televised videos and slide shows, interpretive signs, and displays.

The Open Space and Mountain Parks website (www.osmp.org) is the fifth most heavily visited website in city government. In 2003 there were 335,000 visits, averaging eight minutes per visit.

Enforcement of Regulations

Rangers enforce city ordinances and state wildlife regulations on Open Space and Mountain Parks lands and work with other law enforcement agencies as appropriate. City regulations are intended to provide a safe and enjoyable visitor experience that has minimal impact upon other resources. The majority of summonses are issued for violations of dog management regulations and illegal camping.

Typically, citations are issued as a last resort when there are flagrant or repeated violations. Enforcement is generally accomplished through explanation of rules and why they are important.

Keeping Visitors Safe

Medical Response

All Open Space and Mountain Parks rangers are required to be certified first responders; several are also certified as emergency medical technicians. While they work with other law enforcement and emergency service agencies, because of their experience and familiarity with the land system, rangers are often the first on the scene when responding to medical emergencies on Open Space and Mountain Parks lands. The most common types of emergencies are climbing accidents, injured hikers, and vehicle accidents. Rangers provide initial medical care, direct rescue personnel to the site, document the incident, and assist with patient evacuations. During 2004, rangers responded to 35 medical emergencies.

Wildlife

Rangers and ecologists assist the Colorado Division of Wildlife with bear and mountain lion complaints, especially when public safety is a concern. Open Space and Mountain Parks staff also post signs and enforce wildlife closures in areas of known lion and bear activity to reduce the likelihood of human/wildlife conflicts.

Fire

Wildland fires are a risk to visitor safety. The Program uses a full range of educational tools to educate the community about fire dangers as a way to reduce the likelihood of accidental fires. When fires start, Open Space and Mountain Parks responds with a focus on visitor safety. Many staff members are trained and certified to fight fires. The Program also maintains wildland fire equipment necessary to safely respond to fires. In addition, the city of Boulder has mutual aid agreements in place with many fire protection districts to provide additional response.

Environmental Resources

Plants, Animals, and Ecological Systems

Boulder's Open Space and Mountain Parks is home to an unusual diversity of living things. One quarter (over 800 species) of the vascular plants found in Colorado occur on Open Space and Mountain Parks (A. Armstrong, pers. comm.). Wildlife biologists estimate that approximately 500 vertebrate species use Open Space and Mountain Parks lands for some portion of their lives. This represents a little less than half the number of vertebrates in Colorado. The Colorado Breeding Bird Atlas project found that portions of Open Space and Mountain Parks contained the greatest number of species of breeding birds (101) and habitat types (15) of 1,745 places across the state. Included in this diversity are approximately 48 species considered rare or imperiled by the Colorado Natural Heritage Program and nine other species of concern to Open Space and Mountain Parks ecologists. Several thousand acres of Open Space and Mountain Parks are registered or designated as state natural areas through the Colorado Natural Areas Program.

Agricultural Operations

For some visitors, agricultural operations provide the vistas, scenery, and experiences that contribute to their satisfaction with the Open Space and Mountain Parks program. Agriculture uses include small grain production (mostly barley) and cow-calf operations (hay, pasture, range). Agriculture is an historic land use in the Boulder Valley and is identified specifically in the City Charter as a purpose of Open Space and Mountain Parks. In the increasingly developed landscape, the opportunity to see a farm or ranch in operation has become an "open space dependent" activity. The 16,000 acres of Open Space and Mountain Parks used by local farmers and ranchers are managed under the provisions of leases with the city of Boulder. Agricultural operations generate revenues in the form of lease payments. Lease revenues average approximately $150,000 annually.

Cultural Resources

Uninhabited cabins, hidden foundations, abandoned quarries, coal mines, old farmhouses, and barns dot the Open Space and Mountain Parks landscape suggesting different customs and different times. These features contribute to the visitor experience by providing a starting point for the imagination about the people who once lived and made a living here. In some places the story is clarified by interpretive signs that provide detail about the nature and extent of human activity. In addition to their interest for visitors, cultural sites and artifacts are important from cultural, religious, and scientific perspectives. Although not included as a purpose of Open Space in the City Charter, the Open Space Board of Trustees adopted cultural resource protection as part of the Long Range Management Policies in 1995 (City of Boulder 1995). All Open Space and Mountain Parks

projects with the potential to affect cultural resources, including improvements to trails, trailheads and other visitor facilities, are required to check existing inventories for potential impacts or provide a site specific survey by a qualified archaeologist describing the cultural resources in the area.

Open Space and Mountain Parks Staffing and Funding

Staffing

There are 69 standard staff positions (full-time equivalent) in the Program, organized into six working groups. A large proportion of the positions are directly responsible for providing visitor services and facilities as their primary focus. Every work group has a role in providing services to improve the quality of the visitor experience and reduce impacts to other resources. In 2004 over 50% of the total operating and maintenance (non-acquisitions) budget was dedicated to visitor services and visitor infrastructure.

Table 2.1: Open Space and Mountain Parks Work Group Involvement in Supporting Visitor Services and Facilities

Administrative Services The "front line" for visitor and community member questions and for reserving Open Space and Mountain Parks facilities. This group keeps track of the Open Space Board of Trustees meetings and maintains parts of the Program's website.	**Environmental and Visitor Services** Rangers and educators focus primarily on providing safe and positive experiences. This group works in partnership with ecologists to understand and conserve plants, animals, and natural systems. This group provides educational programs and shares information via the internet.
Land and Facilities Services Maintenance staff and project managers build and maintain trails, trailheads, and visitor facilities. Integrated pest managers are working to minimize the impact of trails and visitor use in spreading weeds. Agricultural managers work to conserve ranching and farming as a way of life in the Boulder Valley.	**Real Estate Services** This work group is responsible for purchasing Open Space and Mountain Parks lands, including negotiating public access easements and other real estate issues such as those associated with ownership and access.
Central Services The public information officer works with the community, the press, and other departments to keep lines of communication open and foster an awareness of public programs and management actions and ways the public can enjoy Open Space and Mountain Parks. Financial services staff oversee the budget and help develop the Capital Improvements Program. Volunteer services staff connect members of the community with Open Space and Mountain Parks projects and programs.	**Planning and Technical Services** Responsible for trails maps and analysis of information about the land. Planners prepare management plans to guide Open Space and Mountain Parks operations and services and oversee monitoring to help keep the program on track.

Current Open Space and Mountain Parks Funding

Protecting land as open space and preserving and maintaining these lands for the use and enjoyment of the community and future generations is expensive. Public funding for purchasing and managing lands has been the principal source of money to achieve these community goals during the past 100 years. The size of the land system and the increasing demands for visitor facilities and services will require additional investments to continue providing a high quality visitor experience and to protect the natural values of these lands.

Revenue Sources

Open Space Sales Tax Revenues. Open Space sales tax revenues are the primary source of funding for the Program. The Open Space revenues are derived almost entirely from sales tax revenues. These sales tax revenues are provided by three citizen-approved, dedicated sales tax increments totaling 8.8 cents per $10 purchase (Table 2.2). Open Space Fund revenues for 2005 are estimated at $19.5 million.

Table 2.2: Sales Tax Financing of the Open Space Fund

Amount (%)	First Year	Last Year
0.40	1967	NA
0.33	1989	2018
0.15	2004	2019
0.88	**Total**	

In addition to sales tax revenues, the Open Space Fund includes revenues from Flagstaff parking fees, facilities rental fees, house rental payments, and agricultural lease payments.

General Fund. About $1 million are projected in 2005 for Open Space and Mountain Parks from the city's General Fund. This amount includes funding to support real estate services for other city programs and Mountain Parks funding that was continued after the consolidation of Mountain Parks and Open Space.

Lottery/Conservation Trust Fund. Lottery revenues available for Open Space and Mountain Parks are projected to be $269,000 in 2005. This funding is scheduled to continue through 2007 and could be extended through a re-evaluation of the city's lottery funding distribution.

The Lottery Fund is financed by revenue from the Colorado Lottery. Annual lottery revenues for the city of Boulder have grown gradually over time and are projected to be $980,000 in 2005. Each year prior to 2001, $150,000 of lottery funds was allocated for the Tributary Greenways Program. The remainder was allocated to the Parks and Recreation Department. Beginning in 2001, lottery funds have been allocated under the provisions of a six-year agreement between Open Space and Mountain Parks and the Parks and Recreation Department. The allocation of lottery funds is described in Table 2.3. For the duration of this agreement, Open Space and Mountain Parks receives $100,000 each year as well as one-half of the balance after Greenways and Parks and Recreation have received their allocation. Parks and Recreation receives the other half of the Lottery Fund balance.

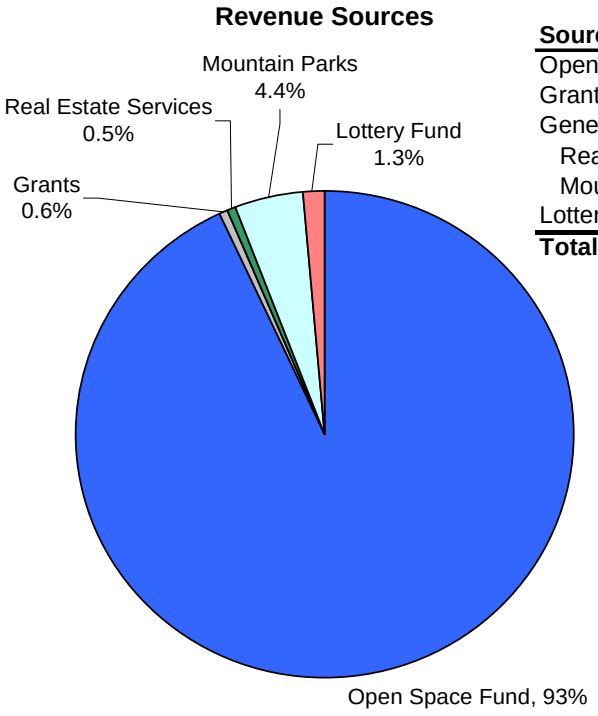
Grants. Grants and donations provide a relatively small source of revenue.

Flagstaff Parking Fees and Facility Rental. Open Space and Mountain Parks collects these fees. The General Fund transfer to Open Space and Mountain Parks is offset by a projection of the amount of parking and rental fees collected in 2000.

Table 2.3: Allocation of City of Boulder Lottery Funding (2002 to 2007)		
Program	**Uses**	**Amount**
Parks and Recreation	Debt Service property acquisition	$416,000 (2002) $304,000* (each year 2003-7)
Open Space and Mountain Parks	Trail and visitor facility rehabilitation	$100,000*
Tributary Greenways	Various projects	$150,000
Total (2002 to 2007)	$554,000	
*Lottery revenues in excess of $554,000 are split evenly between the Open Space and Mountain Parks Program and the Parks and Recreation Department.		

Figure 2.3 shows the sources of annual revenue for the Open Space and Mountain Parks Program.

Figure 2.3: Boulder Open Space and Mountain Parks Revenues for 2005 (2005 Approved Budget)



Source	Revenues		% of Total
Open Space Fund	$	19,475,101	93.2%
Grants	$	120,000	0.6%
General Fund			
Real Estate Services	$	111,177	0.5%
Mountain Parks	$	927,150	4.4%
Lottery Fund	$	268,828	1.3%
Total	**$**	**20,902,256.00**	**100%**

Expenditures

Approximately one-half (45% or $9.9 million) of Open Space and Mountain Parks revenue is used to make payments on debt incurred for the purchase of property. Almost one-fifth (17%--$3.7 million) of the annual revenues are used to purchase new property or as a “down payment” for properties.

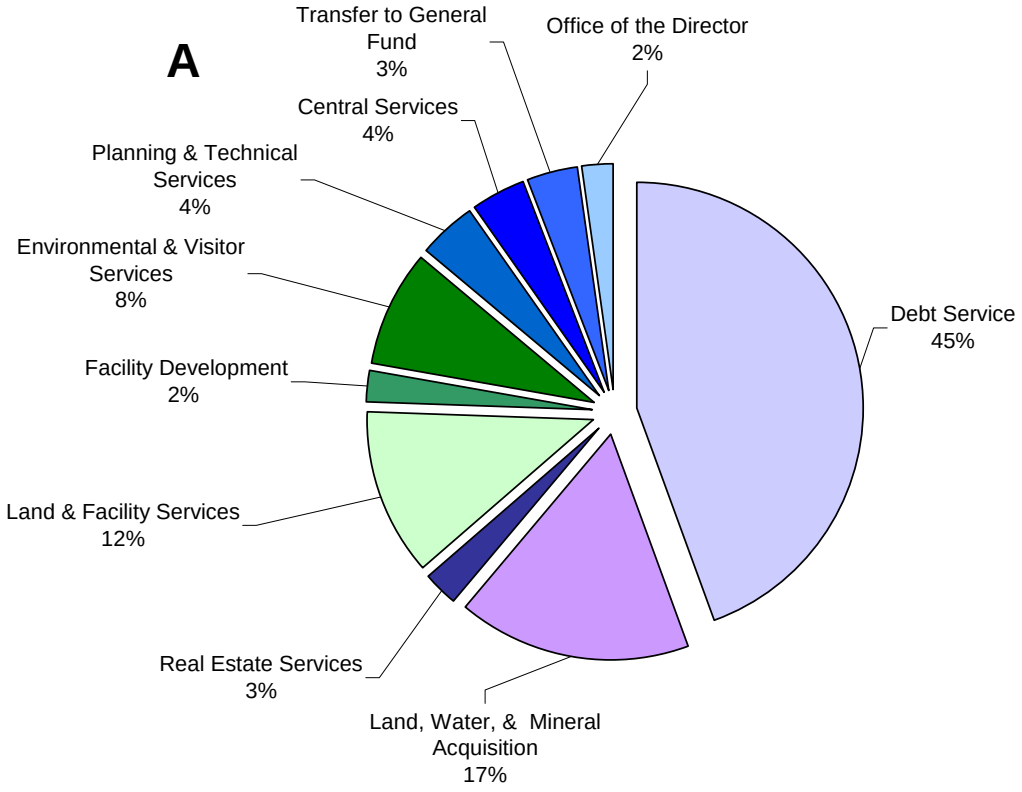
Approximately 2% of sales tax revenues are budgeted for capital improvements of visitor facilities. Salaries and other operating expenses account for the remaining expenditures (approximately $8.6 million, see Figure 2.4a). Operating expenses include $755,000 in transfers to the General Fund for services to Open Space and Mountain Parks by other city departments. This transfer represents approximately 3% of the Open Space and Mountain Parks budget.

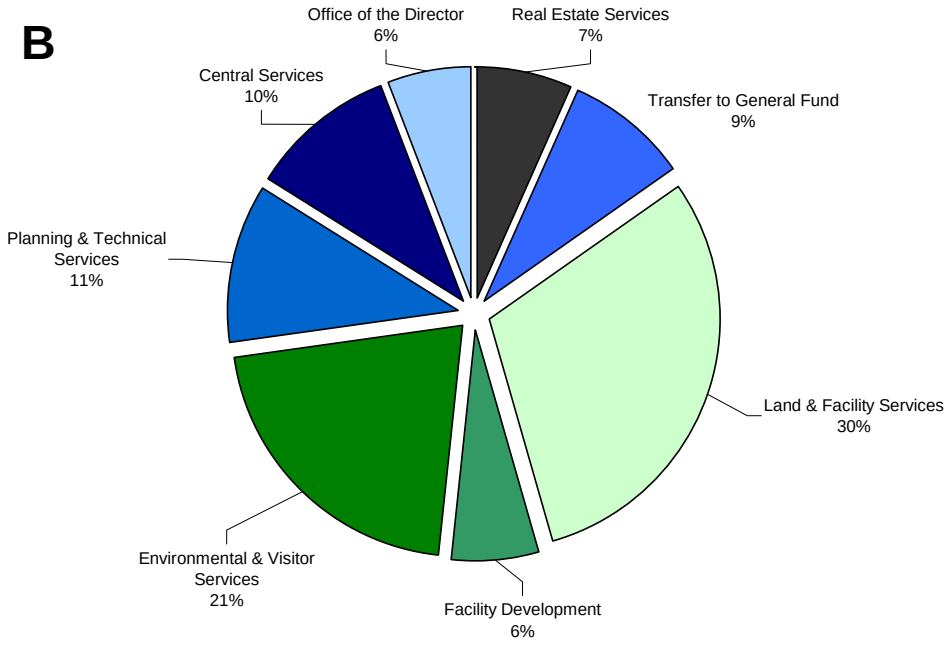
The following charts (Figures 2.4A and 2.4B) illustrate the Open Space and Mountain Parks approved 2005 expenditures.

Figure 2.4A shows the entire budget, including land acquisitions and debt service.

Figure 2.4B shows the operating expenditures which total approximately $8.6 million. Operating expenditures are used for management and protection of natural, cultural, and agricultural resources, as well as facility infrastructure, maintenance, and other environmental and visitor services. In 2005 over 50% of the total operating and maintenance (non-acquisitions) budget for Open Space and Mountain Parks is dedicated to visitor services and visitor infrastructure needs, including junior rangers, ranger services, education and outreach, volunteer services, and capital maintenance and new construction of visitor infrastructure.

Figure 2.4: Open Space and Mountain Parks Expenditures (2005 Approved Budget)
A: Total $22.2 million B: Operating: $8.6 million





Assessment of the Current and Future Management Situation

Current Visitor Use Patterns and Trends: Greater Use, Today and Tomorrow

The Visitor Master Plan has a ten-year planning horizon. It is necessary, therefore, to consider both the current situation as well as relevant trends. Important trends affecting the visitor experience indicate that recreational use of Open Space and Mountain Parks lands will continue to increase.

This section combines information from various sources, summarizing conditions that Open Space and Mountain Parks managers will face in the future. For detailed assessment of the current and anticipated situation for management, see *Condition, Compatibility and Trends: An Analysis of Visitor Experience and Infrastructure and their Compatibility with Resource Conservation* (can be found in Plan Reference Documents available on the Visitor Master Plan page at www.osmp.org).

High and growing level of visitation. The growth in the number of visits in the Open Space and Mountain Parks system has grown from an estimated 250,000 visits in 1980 to and estimated 3,000,000 in 1996. A year long visitation study to be complete in 2005, estimated 1.8 million visits in the first three summer months (June, July, August) of 2004. This increase is due in large part to the large population and employment growth in the Boulder Valley, Boulder County, and the Denver metropolitan region.

Despite the recent softening of the economy, continued growth is predicted for the Front Range and the Denver metropolitan area (DRCOG 2003). Population forecasts for the regional statistical areas adjacent to Boulder are provided in the table below (DRCOG 2003). The Colorado state demographer has estimated a 14% increase in Boulder County population between years 2000 and 2010 (State of Colorado 2004).

Table 2.4: Denver Regional Population Forecast by Regional Statistical Area

Area	2000 Population	Population Forecast 2020	Change	Forecast Annual Growth Rate
Arvada	72,003	82,417	10,414	0.72%
Boulder - Mountains	16,959	20,127	3,168	0.93%
Boulder - TriCities	74,929	108,731	33,802	2.26%
Boulder City - North	40,172	43,098	2,926	0.36%
Boulder City - Periphery	26,977	33,107	6,130	1.14%
Boulder City - South	51,880	57,857	5,977	0.58%
Golden	27,562	47,094	19,532	3.54%
JeffCo - Northwest	5,282	8,997	3,715	3.52%
Longmont	75,940	92,992	17,052	1.12%
Standley Lake	84,152	100,124	15,972	0.95%

Open Space and Mountain Parks is a regional outdoor recreation destination. The attraction of non-Boulder County visitors to the Open Space and Mountain Parks system is high. Boulder Open Space and Mountain Parks is one of the most scenic and opportunity-rich destinations in the Front Range. It is also a world-class climbing area, a regional destination for horseback riding and hang gliding/paragliding, and a destination for dog walkers who want to recreate with their dog off-leash. Open Space and Mountain Parks is the only public land agency on the Front Range that allows extensive off-leash opportunities for dogs.

Increased popularity of outdoor recreation. In addition to the numerous long-time residents that frequent Open Space and Mountain Parks, many new residents moved here because of Boulder's popular outdoor lifestyle. What's more, national trends indicate that higher percentages of the population are taking part in recreation more frequently now than in the past (Cordell 1999, 2002a, 2002b), and this trend is expected to continue. A steady increase in outdoor recreational activities is projected through the year 2040 for walking, bicycling, running/jogging, day hiking, and bird watching. Horseback riding is projected at a smaller increase, while rock climbing stays steady. These increases are due in part to the health benefits associated with an active lifestyle, marketing and promotion by the outdoor equipment industry, and increasing access to information through traditional publications and the internet.

New types of outdoor recreation. Another factor fueling growth in outdoor recreation is the emergence of new types of recreation, especially those that involve mechanically-assisted travel. In the 1980s, bolt-assisted rock climbing became very popular. In the 1990s, mountain biking and hang gliding/paragliding grew tremendously in popularity. During the last few years, bouldering has become more popular. Other types of emerging outdoor recreation activities include: in-line skating and mountain boarding, geocaching, model glider flying, paintball, and extreme trail running. While Open Space and Mountain Parks accommodates many of these activities, others have not been allowed because they create significant negative impacts on other visitors or resources. When new activities emerge, they may create new recreational demands on our lands and the need for a management response.

Differential impacts of growth in recreational activities. As growth in visitation occurs, concentrated impacts often happen because of the limited number of locations where certain activities can occur (as in the case of rock climbing or bouldering) or because increased visitation tends to occur more often in the "front-country", where the most accessible trails and trailheads are available. Some of the concentrated impacts include trail crowding, trailhead parking congestion, trampled vegetation and soil, and networks of undesignated trails. With increased visitation, it is also more and more difficult for visitors to find solitude, which motivates them to travel to more remote areas. In turn, this dispersal of people into the "backcountry" creates further congestion, loss of solitude, and degradation of wildlife habitat.

Constrained land supply versus growing demand. Constrained land supply is another key trend creating new demands on Open Space and Mountain Parks management. Regionally, the open space land base has been growing much more slowly than demand for passive recreation. Undeveloped lands are disappearing as residential and commercial land uses are developed in communities surrounding Boulder. The recent explosive residential growth of Superior and commercial development in Broomfield are just two examples of this trend. Land values continue to increase. Most communities, even those with open space programs, find themselves unable to make purchases to adequately satisfy the recreational needs of their residents. As a result, Boulder and other communities with well-developed open space programs become regional providers of outdoor recreation.

What's Working and What's Not: Potential Areas of Improvement Summary

This summary focuses on the five major planning targets for the Visitor Master Plan: (1) visitor experience; (2) trails, trailheads, and other facilities; (3) natural environment; (4) farming and ranching operations; and (5) cultural resources. The analysis of current conditions helped us appreciate what management strategies are working well and also pointed out problem areas. These problem areas indicated unacceptable conditions or movement toward unacceptable conditions within the Visitor Master Plan's ten-year planning horizon.

This summary of "what's working" and "what's not" is <u>not</u> prioritized.

Visitor Experience

What's Working

- Widespread access to the places people want to go
- Beautiful vistas
- Ability to visit and traverse a wide variety of natural settings
- Availability of areas that seem remote from the built environment
- Few problems with the visual impact or safety concerns associated with vandalism
- Little unwelcome noise
- Majority of users are courteous and respectful of others and the landscape
- Personal safety is not a widespread concern
- Access is provided for a wide variety of activities and challenge levels

Room for Improvement

- Access for mountain biking
- Access for hang gliding
- Access by equestrians (fenced properties)
- Internal trail connections
- External trail connections
- Longer continuous trails
- Transit linkages
- Greater accessibility for disabled populations
- Unwanted dog encounters with other visitors
- Insufficient pick-up of dog waste
- Visual scarring due to erosion/gullying
- Growing levels of conflict and crowding (bicyclists traveling too quickly, conflicts with dogs/guardians, dog-on-dog conflicts, equestrians with dogs, and hikers)
- Dangerous road crossings
- Lack of clarity about trail designation and use (e.g., climbing access)
- Regulations addressing commercial use on Open Space and Mountain Parks

Trails, Trailheads, and Other Facilities

What's Working

- Many popular trails and trailheads
- Clean restrooms and empty trash bins
- Many trails with high-quality surfaces sustaining high levels of multiple uses, with ongoing maintenance

Room for Improvement

- Many physically unsustainable trails

- Lack of trails to some popular destinations
- Backlog of designated trail improvements
- Proliferation of undesignated (and therefore unmanaged) trails
- Trail designs that do not encourage visitors to stay on trail or behave in a manner that supports the physical sustainability of the trails
- Unbuilt trails and trail connections
- For many Open Space and Mountain Parks lands, visitor access and use has occurred without the benefit of management plans and provision of trails or other infrastructure to support the use
- Maintenance and funding levels
- Trailhead parking overflow

Natural Environment

What's Working

- Natural systems, plants, and animals provide much of the basis for a visitor experience that is "Open Space and Mountain Parks dependent"
- The enjoyment of natural systems, plants, and animals builds support for the conservation and protection of these areas
- The condition of native ecosystems in some areas is relatively good

Room for Improvement

- Direct impacts to habitat patches that are limited in extent or distribution (riparian areas, shrublands, tallgrass prairie, cliff faces, bases of cliffs)
- Trampling of vegetation
- Harassment and killing of wildlife by domestic dogs
- Role of trails/visitors/dogs as dispersal mechanism for weeds
- Potential for species displacement with increasing density of trails
- Level of protection from impacts does not correspond to the sensitivity of natural resources

Farming and Ranching Operations

What's Working

- Agricultural operations provide some of the basis for a visitor experience that is "Open Space and Mountain Parks dependent"
- Enjoyment of agricultural systems builds support for conserving and protecting these areas

Room for Improvement

- Dogs harassing livestock
- Trampling of crops and hayfields
- Visitors leaving gates open and/or cutting fences and gates

Cultural Resources

What's Working

- Low levels of vandalism
- Low levels of collection

Room for Improvement

- Isolated and therefore vulnerable sites

Key Unmet Public Desires, Problems, and Opportunities: Relationship to Visitor Master Plan Strategies

The Visitor Master Plan is designed to address those problems and opportunities that will maintain or improve visitor experience, visitor infrastructure, and resource conditions to acceptable levels. It includes several strategies that integrate management actions to achieve desired conditions.

Table 2.5: Key Unmet Public Desires, Problems, and Opportunities: Relationship to Master Plan Strategies

Visitor Master Plan Strategy	Unmet Public Desires or Problems Needing Attention	Available Opportunities
	Note: There are other funding deficiencies besides those noted below.	***Note: Funding to meet many identified needs is available with existing sources; other needs will require additional funds to be obtained, if they are to be addressed during the ten-year planning period.***
Visitor Education and Outreach	• Insufficient visitor motivation or knowledge to use low-impact techniques • Insufficient compliance with dog management regulations (dog control and dog excrement pick-up)	• Most people will be motivated to use low-impact techniques with education • More education to improve dog management compliance
Visitor Safety and Regulation Enforcement	• Unsafe trail crossings with roads • Insufficient compliance with dog management regulations (dog control and dog excrement pick-up)	• External funding for trail crossings • More enforcement of dog regulations
Visitor Opportunity	• Growth-related expansion needs • Unmet desires for more trail connections, more challenging mountain bike terrain, new bolted climbing routes, hang gliding/paragliding launch and landing sites	• New sites for sustainable visitor activities • Sustainable internal and external trail connections • Infrastructure improvements to increase sustainability of off-trail activities (e.g., hang gliding / paragliding, fishing, model glider flying) • Collaboration with climbers in developing a sustainable climbing access system
Visitor Infrastructure	• Growth-related expansion needs • Need for increased level of ongoing trail maintenance • Backlog of deferred maintenance • Unsustainable trail and trailhead designs, locations, conditions • Profusion of damaging undesignated trails • Unmet desire and lack of funding for new trails construction	• New emphasis on ongoing trail maintenance and deferred maintenance (including projects addressing sustainability) • Trail rebuild and reroute projects • Collaboration with climbing and other community groups in developing a sustainable climbing access trail system • Partnerships with community groups and neighboring communities to construct new trails

Table 2.5: Key Unmet Public Desires, Problems, and Opportunities: Relationship to Master Plan Strategies		
Visitor Master Plan Strategy	**Unmet Public Desires or Problems Needing Attention**	**Available Opportunities**
Resource Protection and Preservation/	• Growth-related impacts • Extensive off-trail travel • Lack of designated areas for many off-trail activities • Impacts from off-leash dog activity in sensitive areas and productive agricultural areas needs improvement • Inadequate regulation of special uses • Lack of regulations for commercial use • Nighttime activities in sensitive areas growing • Insufficient use of resource closures, especially for muddy trails • No effective closure of newly acquired properties until management in place • Insufficient information and protection for cultural resources •	• Requirements for on-trail travel • Designation of areas for off-trail activities • Expansion of areas requiring dogs on-leash or no-dogs • Expanded special use permit process • Commercial use permit regulations • Opportunity to retard significant growth in nighttime activities and associated wildlife impacts • Process for managing new recreation uses • Formal closures for newly acquired properties until plans and infrastructure in place • Cultural resource inventories and protections
Visitor Conflict Reduction	• High level of conflict between dogs and other visitors • Conflicts between bicyclists and other visitors • Inadequate regulation of special uses • Lack of regulations for commercial use	• Focused and expanded dog guardian and bicyclist education activities • Focused enforcement on dog management and bicyclist enforcement activities • Expanded special use permit process • Commercial use permit regulations
Visitor Access and Use Fees	• Steep growth in number of non-resident visitors • Insufficient funding for maintenance and operation expenses caused by visitor use • Insufficient mechanisms for cost recovery or influencing the number of out-of-county visitors	• Possible new funding sources • Possible new mechanisms for cost recovery and non-resident user fees
Public Involvement in Plan Implementation	• Desire for public involvement in ongoing plan implementation	• Formal and informal processes for public involvement in ongoing plan implementation

Table 2.5: Key Unmet Public Desires, Problems, and Opportunities: Relationship to Master Plan Strategies		
Visitor Master Plan Strategy	**Unmet Public Desires or Problems Needing Attention**	**Available Opportunities**
Management Areas	• Growth-related impacts • One-size-fits-all regulations instead of area-specific • Need for higher level of protection for sensitive areas and productive agricultural lands • Excessive off-trail travel • Insufficient compliance with dog regulations • Loss of opportunities for solitude	• Area management system • Area-specific regulations • Requirements for on-trail travel • Designation of areas for off-trail activities • Expansion of areas requiring dogs on-leash or no-dogs • Off-trail permit system
Open Space and Mountain Parks Organizational Capacity-Building	• Organizational changes to implement the Visitor Master Plan • Insufficient Open Space and Mountain Parks funding for operations and maintenance • Insufficient staff to implement the Visitor Master Plan • Need for new staff/consultant expertise	• Possible new funding sources • Evaluation of staff and training needs to implement the Visitor Master Plan • Expanded use of consultants/contractors • Expanded partnerships with community groups and other public agencies

Summary of Public Input on the Plan

In the development of the Visitor Master Plan, dozens of public meetings, workshops, field trips, community surveys, and other venues for public input on the Plan were conducted. Two citizen advisory committees produced reports with recommendations for the Visitor Master Plan. Another group with diverse interests, the Community Group Forum, also provided recommendations. Public input on the Plan provided diverse ideas and concerns. Many shared values and points of agreement were voiced but also some points of disagreement. The following is a summary of the overall themes and some of the key points of expressed agreement and disagreement.

There is no single overwhelming desire held by all segments of the community. There is no one overall theme that cuts across all comments; there are multiple themes in public comments, some of which are complementary, others of which conflict.

Some values are shared by many citizens:

- **Open Space and Mountain Parks lands: a valued community asset.** High value is placed on the natural, scenic, and recreational qualities of Open Space and Mountain Parks lands, and there is a strong desire for those qualities to be sustained over time. There is widespread belief that the quality of the environment--the “naturalness” of an Open Space and Mountain Parks lands--is the foundation of the recreational experience and should be sustained over time.

- **Concern about the future.** While many express a high level of satisfaction with the current visitor experience, concern exists about the future because of the potential for additional visitation growth and its associated impacts, as well as funding constraints to adequately deal with them. Many people are worried that as visitation grows, natural resources will be more at risk, and then more visitor restrictions will be imposed to deal with crowding, overuse, and resource protection issues.

- **Support for "recreation" and "environmental preservation" on Open Space and Mountain Parks lands.** Many people desire both recreational opportunities and protection of the Open Space and Mountain Parks natural environment. Some variation on this theme is expressed by different individuals and groups who sometimes emphasize one more than the other.

- **"Balance" in decision-making about visitor use and resource protection.** While there are differing definitions of "balance," for many people it means both the quality of the visitor experience and the quality of natural resources must be maintained and enhanced over time. Designation of management areas is seen by many as a useful tool for achieving overall balance among competing uses of Open Space and Mountain Parks lands.

- **Support for education.** There is wide support for educational activities to foster the connection that people feel with the land, reduce conflicts among different recreational activities, instill user ethics, and encourage low-impact use.

- **Expanded recreational opportunities.** In general, recreational user groups want more from Open Space and Mountain Parks--more recreational areas and opportunities, more facilities supporting their activities, and more freedom to "do their thing." Rock climbers, for example, want more bolt-assisted routes, while mountain bikers want more trails on challenging terrain, and horseback riders want more trails and off-trail riding opportunities.

- **Retention of existing recreational opportunities.** Concern has been expressed that Open Space and Mountain Parks should not eliminate any existing recreational opportunities. A strong current of expression has come from dog guardians who want to maintain their present dog off-leash freedoms and from rock climbers who want to maintain the freedom to explore new climbing routes and create new bolted climbs.

- **Assumed low impact.** Virtually every user group identifies the need to protect the resources, but feels its activity has minimal impact on resources. However, virtually all groups express the desire to contribute to the long-term stewardship of the land.

- **Preserve the environment.** This general value is widely articulated. Some of the major preservation concerns include: protection of habitat, sensitive species, and biodiversity; reservation of some land for wildlife; management of visitor use so that it does not exceed the carrying capacity of natural systems or degrade remaining large habitat blocks; the need to channel visitors away from sensitive areas; and the need to aggressively attack weeds and restore damaged ecosystems. There is wide agreement that trails should be precluded in highly sensitive areas, as well as wide support for wildlife closures when necessary.

- **Expand trail opportunities and additional trail improvements.** Some specific desires mentioned include: longer (day-long) trails, more trail loops, new trails in various areas; trail connections within the Open Space and Mountain Parks system and regional trail connections; high quality of experience (e.g., interesting routes not near roads or development); safe trail crossings across roads; and separation of trail uses (e.g., different trails for different uses, time-sharing among users).

- **Preserve the backcountry experience.** There is a desire to maintain opportunities to experience solitude in relatively pristine and lightly visited backcountry areas, even as this solitude may be harder to find over time.

- **Additional restrictions on visitor use**. There are divergent views on the desirability of additional restrictions to protect resources. A considerable segment of the public supports additional restrictions on visitor use. Others do not support additional restrictions, in principle, or because they don't believe conditions warrant them.

- **Additional restrictions on dogs.** There are divergent views on the desirability of additional restrictions on dogs to protect resources and reduce conflict. A considerable segment of the public seeks greater opportunities to use Open Space and Mountain Parks without the conflicts they associate with dogs. Some also feel that the impacts of dogs to environmental resources are unacceptable. These members of the community support additional restrictions on dogs, such as no-dog areas as well as on-trail and dog on-leash requirements. Others do not support additional restrictions, because they prefer the existing conditions, or because they do not believe conditions warrant them.

- **Justification for restrictions.** Concerns are articulated that: restrictions on use must be justified by objective scientific studies and data, restrictions must be "fair," and Open Space and Mountain Parks should use the least-restrictive method to achieve management goals.

- **Diverse range of opinions.** Divergent opinions were expressed by many people on a variety of issues. For example, divergent views on whether or not to:

    - Build new trails and parking facilities
    - Disperse or concentrate visitor use
    - Selectively impose on-trail restrictions for resource protection
    - Close or keep existing undesignated trails
    - Require dogs on-leash in more areas
    - Allow new bolted climbing routes
    - Build wide multiple-use trails or keep trails narrow
    - Shift land acquisition funding to build more trails and increase maintenance

Chapter

3

Planning Goals, Guiding Principles, Services, and Policies

Visitor Master Plan Goals

To achieve the vision for the Visitor Master Plan, Open Space and Mountain Parks worked closely with two citizen advisory committees to define four key goals.

Goal 1: Enhance the experience

Maintain or enhance the quality of the visitor experience when engaged in passive recreational activities such as hiking, climbing, and bicycling.

- Make visitors feel welcome on Open Space and Mountain Parks lands.
- Support a variety of passive recreation opportunities for the enjoyment of visitors.
- Provide a high level of personal safety for visitors.
- Foster a sense of value, appreciation, and care for Open Space and Mountain Parks resources.
- Encourage understanding, respect, and compatible behavior among visitors. This is especially applicable to visitors who engage in different types of passive recreation.

Goal 2: Improve access

Provide and maintain highly functional and sustainable visitor facilities that support visitor access to appropriate destinations and add to the quality of their experience.

- Provide trails to major destinations within Open Space and Mountain Parks.
- Link trails to create an interconnected trail system.
- Build trails and facilities that are both physically and environmentally sustainable.
- Provide clean and attractive visitor facilities to support passive recreation.
- Maintain and improve visitor trails and facilities to a level that keeps deferred maintenance needs to a minimum.
- Reduce the long-term costs of maintaining facilities to an acceptable standard.

Goal 3: Enjoy and protect

Ensure that passive recreational activities and facilities are compatible with long-term protection of natural, agricultural, and cultural resources.

- Avoid or minimize negative impacts of visitor activities on natural, cultural, and agricultural resources.
- Preserve and restore higher quality natural areas by directing visitor use to appropriate areas and away from sensitive areas.
- Locate, design, and maintain trails and facilities in ways that make visitor activities and protection of resources mutually compatible.

- Restore habitat damaged by past visitor use.

Goal 4: Partner with the community

Partner with the community in passive recreation decision-making and stewardship efforts.

- Foster the public's understanding of the need for management of visitor activities and their crucial role in implementing a management system.
- Actively involve the public in decisions affecting passive recreation and resource stewardship activities on Open Space and Mountain Parks lands.
- Improve the quality of public discourse to implement and refine the Visitor Master Plan, deepening public trust in the process.
- Provide a range of volunteer opportunities that allow visitors to help take care of Open Space and Mountain Parks lands and better appreciate its resources.

Guiding Principles

Sense of Welcome. Foster a sense of welcome while accommodating visitor activities that both create enjoyment and appreciation of nature and the outdoors, and are compatible with resource protection and preservation.

Balancing Competing Uses. Seek to balance competing community needs and desires and to be fair in allocating recreational use opportunities. Currently, open space purposes, as defined in the Open Space Charter, are not prioritized among competing uses.

Best Information. Use the best available information (see inset) when making management decisions with the goal of making sound decisions based on consideration of all relevant factors, needs, and values. When available, scientific information on the existing and desired conditions of natural, agricultural, and cultural resources and the impacts of visitor use on them, shall be used as well. When key information gaps exist, Open Space and Mountain Parks shall take reasonable measures, through independent or collaborative efforts, to generate or obtain new or improved information that will reduce uncertainty and improve decision-making.

Elements of a Best Information Standard

- *Use the best information available without unreasonable cost, effort, or time.*
- *Use diverse and inclusive information sources as applied to a particular circumstance. These may include biological/ecological concepts and data, visitor desires and use patterns, information generated by Open Space and Mountain Parks staff, values of the community, socio-economic information, and other sources.*
- *Use the most relevant, high-quality, and up-to-date scientific information--research studies, monitoring results, analyses, impact assessments, public opinion surveys, "expert" knowledge, and other types of information.*
- *Use both quantitative and qualitative information.*
- *Consider the quality, reliability, and limitations of the information.*
- *Assess trade-offs in outcomes, interests, and values.*
- *Evaluate alternatives that represent a spectrum of decisions or approaches.*

Dealing with Uncertainty. As established by the Open Space Charter, preserving the natural environment is essential to maintaining the quality of the visitor experience. Open Space and Mountain Parks shall be careful to protect and preserve environmental resources when there is uncertainty about their conservation status, the impacts of visitor use, and/or the effects of management actions. Open Space and Mountain Parks will assess management alternatives and determine appropriate resource protection measures when there are reasonable grounds for concern regarding threats of potentially serious or irreversible resource damage. Open Space and Mountain Parks will use the best available information to assess and weigh the benefits and impacts of the various management alternatives (including no action) and then select the best overall management action in order to achieve appropriate resource protection.

Creative Solutions to Site-Specific Conflicts. When there are conflicts between resource protection and visitor use, management priorities will be established by considering the context provided by the underlying management area designation. Open Space and Mountain Parks shall attempt, working with the public, to find creative solutions that mediate between providing new or enhanced recreational opportunities and avoiding, minimizing, or mitigating the impacts of visitor use.

Least-Restrictive Management Approach. Use the least-restrictive means possible to achieve management goals. More restrictive solutions will be incrementally implemented if less restrictive solutions are ineffective.

"Good Neighbor" Policy. Employ a "good neighbor" policy to prevent or mitigate adverse visitor use impacts on adjacent private or public lands.

Flexible, Adaptive Management. Implement an adaptive management approach that: monitors visitor experience, visitor infrastructure, and resource conditions, assesses the effectiveness of management actions, and revises them based on new information gained from research and experience.

Visitor Master Plan Initiatives, Services, and Policies

Education and Outreach Initiative

Services

Education and outreach services provide understanding and appreciation for natural resources and processes and other Open Space and Mountain Parks values. Fostering this understanding and appreciation adds to the quality of visitor experience and creates connections that people can feel with natural and agricultural landscapes. Education and outreach services also provide knowledge about low-impact visitor techniques, which enable environmentally responsible visitor use.

Policies

Emphasis on Education. Emphasize education and interpretation as tools to create public understanding and support for maintenance and enhancement of the quality of visitor experience and the protection of natural, agricultural, and cultural resources.

Excellence in Education. Provide education and outreach services that build personal and community connections with the land, enable visitors to use low-impact educational and recreational techniques, and promote partnerships in the stewardship of our lands.

Safety and Enforcement Initiative

Services

Safety and regulation enforcement services are directed at providing acceptable levels of personal safety and risk associated with physical hazards, and the absence of illegal activities. Management activities are designed to allow visitors to feel safe, avoid physical safety hazards, and induce compliance with laws and regulations.

Policies

Safety Comes First. The protection of visitors and resources is the highest priority in operation and maintenance functions. Management actions to protect visitor safety will be implemented as quickly as necessary.

Recreational Opportunities Initiative

Services

Many different kinds of services are directed at maintaining and expanding the variety of passive recreation activities on Open Space and Mountain Parks lands: providing information and signs, trails and facilities, ranger patrol and enforcement, guided hikes, and more.

Policies

Support for High-Quality Passive Recreation and Education. Foster visitor enjoyment, connection with the land, and shared stewardship.

Diverse Recreational Opportunities. Continue to provide a wide range of passive recreation and outdoor education opportunities that are appropriate in a natural area setting and compatible with protection of natural, agricultural, and cultural resources.

Services for People with Disabilities. Provide services and facilities that expand opportunities for people with disabilities to enjoy passive recreational and educational activities.

Trails and Facilities Initiative

Services

Construction and maintenance of trails and facilities provides opportunities for visitor travel, access to major destinations, and support for specific passive recreational activities. Providing functionality in the trail system is important to visitor convenience and enjoyment. Durable and environmentally sustainable trails and facilities ensure visitor safety and long-term protection of the environment. Trails and facilities that are aesthetically pleasing add to the quality of visitor experience and encourage visitors to stay on trails and “tread lightly on the land”. Other services that add to the quality of the visitor experience include timely maintenance of sanitation facilities, provision of receptacles for dog excrement, graffiti removal, and trash pick-up. These services also encourage visitors to take good care of resources and facilities.

Policies

Support for Visitor Trails and Facilities. Provide trails and facilities that support a quality visitor experience and protection of resources.

Travel Opportunities. Provide opportunities for visitor travel to major recreational destinations on safe, enjoyable, and physically and environmentally sustainable trails that offer a variety of experiences and challenge levels.

On-Trail Travel. Encourage visitors to travel on trail by: (1) providing designated trails to major destinations and links between trails that give visitors opportunities for longer-distance trail experiences; and (2) providing education, signs, and maps.

Multi-Use Trails. Provide trails where visitors are permitted to travel using various options (e.g., on foot, on bike, on horseback, with dog, etc.), when travel options are compatible and environmentally sustainable.

Loop Trails. Provide options for visitors to travel on loop trails, where practical, feasible, and environmentally sustainable.

Physical Accessibility. Design trails and other visitor facilities to be accessible for people with disabilities when and where appropriate.

Trailheads. Provide safe and convenient trailheads, with periodic refurbishment or redesign as visitor needs change.

Alternate Modes. Provide facilities and services to visitors to encourage their use of alternate transportation modes (e.g., bike racks, co-location of trailheads and transit stops, etc.).

Infrastructure Priorities. Give priority to visitor infrastructure improvements that provide for visitor safety, maintain existing trails and facilities, improve physical and environmental sustainability, and protect resources. Build new trails and facilities, as needed and as financial resources allow.

Sustainable Maintenance. Implement a trail and facility maintenance program that is cost effective in meeting sustainability standards over the long term.

Facility Location and Design. Locate and design trails and facilities that are physically and environmentally sustainable, with the following requirements: Under normally scheduled maintenance and normal wear and tear, the trail or facility remains in an acceptable condition that provides intended access, safety, and visitor enjoyment and minimizes negative impacts on the environment such as accelerated drainage, erosion, spread of weeds, and others.

Integrate the goals of engendering stewardship, aesthetics, and resource protection into trail and facility design.

Funding for Infrastructure. Increase the overall level of funding for maintenance and construction of trails and other facilities over time, in order to “catch up” in deferred maintenance and enhance the visitor experience with improved infrastructure.

Resource Protection Initiative

Services

Resource protection services include a variety of activities designed to channel visitors to those places and times that can accommodate use without unacceptable resource impacts, and ensure compliance with resource protection regulations. The desired effects of resource protection services is increased environmental sustainability and reduced visitor use impacts on natural, agricultural, and cultural resources.

Policies

Resource Protection. While supporting high-quality visitor opportunities, take actions to prevent resource degradation and support restoration of native populations and ecological systems. The minimum objective of management actions is to "do no harm." Where recreational activities may, will, or could harm the environment, Open Space and Mountain Parks shall avoid, minimize, and mitigate impacts. Restricting visitor activities will be a last resort.

Sustainability. Support management actions that ensure long-term, sustainable passive recreational experiences and natural values. To be sustainable in the long-term, visitor use must not:

- Degrade the integrity and diversity of natural, agricultural, and cultural resources
- Detract from the quality of recreational experience
- Overwhelm the capacity of facilities to provide acceptable levels of service

Management strategies will be directed at ensuring that future passive recreational experiences and the condition of the natural environment are of the same quality or better than they are today.

Managed Access. Strengthen management of visitor access to maintain acceptable, and reduce unacceptable, conditions related to the visitor experience, visitor infrastructure, and resource protection. Implement a system of "managed access" that maintains the quality of both the visitor experience and resources.

Protection of Sensitive Areas. Direct visitor use to appropriate areas and away from sensitive areas. Some uses or levels of visitor use may need to be limited or not allowed, in order to protect natural, agricultural, and cultural resources.

Designation of Activity Areas. Designate appropriate areas for specific passive recreational activities and identify areas where specific activities are not appropriate and will be prohibited, in order to protect the quality of visitor experience and preserve and protect resources.

Resource Conservation Design. Integrate resource conservation goals into guidelines for facility design, construction, and maintenance of trails, trailheads, and other visitor facilities.

Special Use and Commercial Use. Implement administrative oversight of special use activities and commercial operations through discretionary permit processes.

Review of New Activities. Evaluate whether or not "new" recreational activities are "passive" and appropriate on Open Space and Mountain Parks lands.

Prerequisites for New Properties. Complete site management plans and provide appropriate infrastructure for newly acquired properties before opening them for public access.

Competitive Events. Prohibit competitive events on Open Space and Mountain Parks lands because of unacceptable visitor and resource impacts.

User Conflict Reduction Initiative

Services

Services directed at reducing visitor use conflicts are designed to reduce conflict with dogs, cyclists, or other visitors, and thereby increase visitor satisfaction and enjoyment. Services include education, physical or temporal separation of uses, enforcement or regulations, and others.

Policies

Conflict Reduction among Visitor Activities. Provide education and outreach services, publicize and enforce regulations, and construct infrastructure improvements that reduce conflict among visitors.

Targeted Areas for Conflict Reduction. Target efforts aimed at reducing visitor conflicts to areas with concentrated visitor use or congregation of specific activities that may lead to conflict.

Public Involvement Initiative

Services

Public involvement services involve providing a variety of meaningful ways for the public to give input to decisions affecting Open Space and Mountain Parks lands. The intent is to make people feel that their ideas are considered and make better decisions because of better information about public needs and desires.

Policies

Openness and Responsiveness. Implement open, inclusive, and responsive public involvement processes that provide information about key management decisions affecting visitor experience, visitor infrastructure, and resource conditions.

Partnerships. Collaborate and partner with community groups to provide services and infrastructure that support passive recreational activities and use of low-impact techniques.

Transparent Decisions. Provide information to the public that makes decisions both understandable and transparent.

Accountability. Be open to ideas and concerns offered by the public and respond to them when possible.

Chapter

4

Visitor Master Plan Implementation

This chapter outlines several Visitor Master Plan initiatives, which organize and group management strategies. The chapter also lays out an important tool for implementing various management strategies, namely a system of Open Space and Mountain Parks Management Areas.

The Visitor Master Plan integrates various management strategies to achieve desired conditions in Open Space and Mountain Parks. Strategies are packages of management actions which include existing and proposed programs and other projects.

Management strategies are designed to:

- *Maintain or enhance* acceptable conditions for visitor experience and supporting visitor infrastructure (e.g., trails, parking, shelters, etc.)
- *Minimize the impact* of visitor activities on natural, agricultural, and cultural resources
- *Improve or restore* visitor experience, infrastructure, and resource conditions to an acceptable level if they fall below thresholds of acceptability

These strategies are based on: an analysis of the current context for managing visitor use (summarized in Chapters 1 and 2); an assessment of the relationship of existing visitor experience, visitor infrastructure, and resource conditions relative to acceptability thresholds and improvement opportunities (summarized in Chapter 3); and an analysis of management needs and issues.

The Visitor Master Plan initiatives are:

1. Education and outreach initiative
2. Safety and enforcement initiative
3. Recreational opportunities initiative
4. Trails and facilities initiative
5. Resource protection initiative
6. User conflict reduction initiative
7. Public involvement initiative

A Word About Adaptive Management

Given the context of uncertainty, managing visitor use and natural resources is often experimental. Many times the most effective strategies must be discovered through objective monitoring and modification, an approach called adaptive management. An adaptive and cautious approach considers changing circumstances, creates opportunities to incorporate new information and evaluate unanticipated activities, and minimizes the likelihood of irreversible environmental impacts.

1. Education and Outreach Initiative

Connecting with the community and educating visitors requires strategies designed to:

- Foster an appreciation of our Open Space and Mountain Parks resources and their sensitivity to visitor impacts
- Reduce visitor conflict
- Help visitors reduce their impact on natural systems, agricultural operations, and cultural resources
- Encourage productive collaboration between Open Space and Mountain Parks and community groups--from exchanging ideas to combining hands-on and financial resources to improving low-impact visitor behaviors

Management Strategies

Educational Programs and Public Information. Motivate the public to help ensure that educational and recreational activities are sustainable in the long term, using educational information and interpretive themes. A variety of communication mechanisms can be used, including: the Open Space and Mountain Parks website; trailhead contacts; interpretive, regulatory, and informational signs; trailhead board posters; educational presentations and interpretive hikes; media articles; brochures; maps; guidebooks; and outreach contacts with community groups and at community events.

Key Messages

- Open Space and Mountain Parks offers a range of experiences and opportunities to connect with and enjoy the land.
- There are unique values associated with using Open Space and Mountain Parks lands.
- Within Open Space and Mountain Parks, there are many stories (geological, ecological, cultural, and agricultural) relevant to the experience of visitors.

Providing news and useful information about Open Space and Mountain Parks (through a variety of venues, including the media) would also be part of this educational program.

Visitor and Community Contact Program. Continue to deliver consistent and repeated messages on low-impact visitor techniques, which are implemented through the front-country Leave-No-Trace program and other outreach activities. Face-to-face education and outreach contacts occur in various places--trails, trailheads, the Chautauqua Cottage, the Flagstaff Nature Center, and community special events such as the Boulder Creek Festival, Farmers Market, and events targeted at University of Colorado students.

- Encourage visitors to limit their use to designated trails (involves placing signs at undesignated trails and providing education and outreach contacts).
- Continue focused education efforts to increase compliance with dog management regulations (includes placing informational/regulatory signs at trailheads and along trails, conducting dog management classes (often in collaboration with other agencies), trailhead and trail outreach contacts, and focused dog excrement pick-up education, i.e., “1+1 pick-up” program).
- Communicate the importance of closing gates on agricultural properties.

Community Outreach. Develop or continue outreach programs to community groups that influence visitor activity on Open Space and Mountain Parks lands.

- Collaborate with these groups to educate Open Space and Mountain Parks visitors.
- Provide volunteer opportunities for community members to deepen their commitment and formalize their relationship to Open Space and Mountain Parks lands.
- Encourage compliance with Open Space and Mountain Parks regulations.
- Involve the community in the planning and construction of sustainable trails and other visitor facilities.
- Work with community groups to create user group "codes of ethics" to reduce visitor conflict and activity impact.

Dog Voice-and-Sight Video and Tag Program. Implement a dog voice-and-sight video education and tag program that would be required for all dog guardians who wish to take advantage of voice-and-sight control privileges. The video will depict realistic and enforceable dog management behaviors to meet the voice-and-sight dog management regulations. Upon completing the video education requirement and agreeing to keep their dogs under control, dog guardians will be issued a highly visible tag that must be worn by all off-leash dogs; without this evidence dogs would be required to be on-leash. This voice-and-sight control tag requirement will be phased in.

Author/Publisher Outreach. Work with authors and publishers of maps and outdoor recreation guides to ensure Open Space and Mountain Parks opportunities are appropriately placed and described. Information and guidance from third parties can play a constructive role in promoting Leave-No-Trace principles and encourage responsible stewardship of Open Space and Mountain Parks lands.

2. Safety and Enforcement Initiative

Keeping visitors safe is a top priority. The Open Space and Mountain Parks Program seeks to improve the visitor experience and reduce resource impacts by providing services that protect personal safety.

These services involve communicating and enforcing regulations to enhance visitor safety, reduce conflicts, and protect resources. Most visitors understand the rules and their rationale. Some people choose to ignore or violate Open Space and Mountain Parks regulations, and education is unlikely to successfully change the behavior of this segment of visitors. Education and enforcement appear to be an effective combination to change visitor behaviors.

Management Strategies

Keep Visitors Safe

Emergency Response. Respond safely and quickly to fires, medical emergencies, hazardous situations, law enforcement incidents, and rescue operations. Provide timely and effective assistance to visitors.

Infrastructure Safety. Identify and respond to unsafe conditions and access associated with infrastructure. These interventions are designed to quickly respond to hazards and remove threats to visitors.

Response to Identified Natural Hazards. Respond to natural hazards with appropriate actions that prevent harm to people, resources, and facilities. Repair damage to resources and facilities.

Road Crossings. Improve the safety of "critical" road crossings. A variety of solutions are needed to provide safety to visitors where trails cross roads (at-grade pedestrian crossings/striping/warning signs, underpasses, overpasses, pedestrian signal lights, stoplights, etc.). These improvements are expensive and frequently require multi-agency funding.

Livestock and Visitors. Provide for safe interactions between livestock and visitors. This strategy primarily involves segregating bulls and cows with calves from trails where appropriate, but may also involve closing trails at times. Signs provide warnings to visitors. The need for caution is publicized through media and outreach contacts.

Parking Safety and Enforcement. Enforce roadside parking prohibitions in cooperation with the County Sheriff's Office and the Colorado Department of Transportation. Multi-agency collaboration is needed to identify problem areas, post signs, and enforce roadside parking prohibitions.

Enforce Regulations

Ranger Patrol. Provide a consistent level of ranger patrol coverage. This base patrol checks trailheads, trails, and properties and also monitors and manages visitor use and resource protection. Provide more ranger patrols in high-use areas and areas with special resource protection needs, where conflicts are more likely to occur.

Dog Management Regulation Enforcement. Focus enforcement on compliance with dog regulations for leash control, voice-and-sight control, and waste removal. This involves prioritizing patrol areas, placing educational and regulatory signs, and making trailhead and trail ranger contacts. If necessary, revise voice-and-sight control regulations to improve clarity and enforceability.

Dog Management Compliance Studies. Develop an information base to assess the status of dog management, fill key gaps in knowledge about the impacts of dogs, and evaluate the effectiveness of dog management projects and programs.

- Develop service standards for dog management regarding overall level of compliance.
- Working with the community, continue a dog voice-and-sight control demonstration project for selected trails.

Dog Voice-and-Sight Education and Certification. Implement a dog voice-and-sight certification system, which would be voluntary except for repeat offenders who want to regain voice-and-sight privileges. Open Space and Mountain Parks would collaboratively determine the standards and work with the Boulder Valley Humane Society, dog trainers, other qualified providers, and others to implement the program.

Graduated Fines for Dog Management Violations. Establish a graduated system of fines for violations for both dog voice-and-sight offenses and dog waste pick-up offenses. Penalties would escalate from less to more severe fines, loss of voice-and-sight privilege, and banning individual dogs, and may involve community service requirements if imposed by the court.

Ranger Educational/Informational Contacts. Provide ranger contacts with the public to educate and inform. These services complement and strengthen the effectiveness of enforcement activities.

3. Recreational Opportunities Initiative

Open Space and Mountain Parks seeks to provide a broad diversity of educational and recreational opportunities, a high quality of visitor experience, and enhancements to current opportunities when compatible with resource protection and preservation.

Management Strategies

Bicycling

Retrofitting Trails for Bikes. As trail improvement projects are being planned, give consideration to the appropriateness of designating and constructing them to include bicycling.

New Bike Trails. Work with community groups to examine the feasibility of possible mountain biking/multiple-use trails that would: (1) connect the east side of Mountain Parks to Walker Ranch or U.S. Forest Service land; and/or (2) provide more mountain biking opportunities west of State Highway 93.

Climbing

New Climbing Bolts. Continue to implement and evaluate a pilot program for limited new climbing bolts in designated areas. The current pilot project is located in the vicinity of Dinosaur Mountain. Project goals include considering a limited number of new hardware-assisted climbing routes that can support sustainable use and improving the sustainability of existing routes (which could mean changing them, removing them, and restoring damaged resources).

Climbing Access Trails. Collaborate with the climbing community to develop a system of climbing access trails that provide sustainable access to desired destinations. This action involves: evaluation of existing undesignated trails with defined criteria; decisions on which trails to designate, close, or improve; and restoration of natural resources damaged by historically unsustainable access.

Hiking

Off-Trail Permits. Implement a permit system for off-trail use in Habitat Conservation Areas (HCAs), in order to provide for officially-sponsored activities and use by the general public. These activities will be subject to Open Space and Mountain Parks regulations consistent with management goals for Habitat Conservation Areas, which may include limiting the number of permits issued due to individual or cumulative impacts.

No-Dog Trails

New No-Dog Opportunities. Establish additional no-dog opportunities on some trails, using a collaborative process and suitability criteria.

Information on No-Dog Trails. To avoid conflicts and provide dog-free opportunities, establish and publish, on the Open Space and Mountain Parks website and elsewhere, a list of "no-dog" trails.

Voice-and-Sight Control Demonstration Projects

Preservation of Voice-and-Sight Opportunities. Implement a dog voice-and-sight control demonstration project for selected trails, in collaboration with Friend interested in Dogs and Open Space (FIDOS) and others. Initial pilot studies include Big Bluestem/South Boulder Creek Trail and Sage Trail.

- The demonstration would determine whether voice-and-sight control would continue or be replaced by an on-leash requirement (either all-year or seasonal).
- During the demonstration, targeted education, enforcement, and monitoring of voice-and-sight control are included in the project.

Hang Gliding/Paragliding

Launch and Landing Areas. Provide designated launch and landing area(s) for hang gliding and paragliding.

- Designate areas for hang/paragliding activities in order to reduce resource impact and visitor conflict.
- Designate and construct a sustainable trail to the launch site at Wonderland Lake, in order to minimize resource impacts.
- Work with community groups to determine if other Open Space and Mountain Parks sites could be designated for sustainable hang gliding and paragliding activities.

Off-Trail Activities

Designated Areas and Conditions for Off-Trail Activities. Provide designated areas and appropriate infrastructure and conditions for off-trail passive recreation activities. Examples include hang gliding/paragliding, fishing, horseback riding, orienteering, model glider flying, and sledding.

Opportunities for People with Disabilities

Facilities and Services for People with Disabilities. Increase services available to community members regardless of physical ability. Implement infrastructure and service improvements and provide other appropriate services that offer access to a broad spectrum of abilities.

4. Trails and Facilities Initiative

Trails provide and guide visitor use on Open Space and Mountain Parks lands, and allow visitors to travel to desired destinations. Other facilities are designed to make certain kinds of educational and recreational activities possible and enjoyable. Open Space and Mountain Parks will redesign existing trails and trailheads, and build new trails and facilities to meet defined standards for physical and environmental sustainability. Open Space and Mountain Parks also will maintain trails and facilities to sustainability standards. Priority will be given to completing deferred maintenance and redesigning existing trails and facilities over constructing new infrastructure.

Management Strategies

Trail, Trailhead, and Facility Maintenance. Implement a trail and facility routine maintenance program that is cost effective and meets physical and environmental sustainability standards over the long term. Maintenance to sustainability standards lowers

the cost by preventing unnecessary or more costly improvements while extending the service life of trails and facilities and protecting the public investment.

Trail Classification System. Define and implement a hierarchical system of trails and associated trail construction and maintenance standards. Trail classes should encourage visitors to travel on-trail and minimize impacts, and they should include high-use trails, medium-use trails, low-use primitive trails, and activity-specific trails. Facility design, construction, and maintenance should be incorporated into the standards.

Trail Planning. Collaborate to study and evaluate possible new trails and trail connections, and their relationship to management area designations. Assess visitor access and resource protection needs, propose new sustainable trails and improvements, and schedule them in the Open Space and Mountain Parks Capital Improvements Program for Trail Study Areas. Planning for the Trail Study Areas will produce a comprehensive set of recommendations for a given area, including:

- Actions for existing trails--improvements and relocations
- Actions for undesignated trails--designation and relocation or improvement, designation without improvement, and elimination and restoration.
- Actions for new trails--construction of new trails and linkages

The intent is to complete Trail Study Areas throughout the Open Space and Mountain Parks system. The initial priorities for Trail Study Areas are:

- **Marshall Mesa/Southern Grasslands Trail Study Area.** In West Marshall Mesa Passive Recreation Area, East Marshall Mesa Natural Area, and Southern Grasslands Habitat Conservation Area. Includes consideration of new trailhead at City Limits property.
- **Eldorado Mountain/Doudy Draw Trail Study Area.** In Eldorado Mountain Habitat Conservation Area and the portion of Doudy Draw Natural Area west of State Highway 93. Includes access to Peanuts Wall and Mickey Mouse Wall climbs.
- **North Foothills Trail Study Area.** In North Foothills Habitat Conservation Area.
- **Union Pacific/White Rocks Trail Study Area**. In Creek Confluence Natural Area and Lower Boulder Creek Habitat Conservation Area.
- **East Boulder/Dry Creek Trail Study Area.** In East Boulder Natural Area and Dry Creek Passive Recreation Area. Includes consideration of trail connections with Dry Creek trails.
- **Tallgrass Prairie East Trail Study Area.** In Tallgrass Prairie East Habitat Conservation Area. Includes consideration of U.S. 36 underpass.
- **Mountain Parks North Trail Study Area.** In Flatirons/Mountain Backdrop Natural Area and part of Flagstaff/ Chautauqua Passive Recreation Area. Includes access to non-contiguous Sacred Cliffs climbs in the Western Mountain Parks Habitat Conservation Area.
- **Mountain Parks South Trail Study Area.** In Flatirons/Mountain Backdrop Natural Area.
- **Shanahan/South Mesa Trail Study Area.** In Shanahan Natural Area and South Mesa Passive Recreation Area. Includes consideration of a possible connection between South Boulder Creek Trail and Community Ditch Trail.

(See Map 4.1 for the Trail Study Areas Map.)

Trail Reconstruction. Address major trail reconstruction needs. Initiate trail rebuilding and rerouting to improve physical and environmental sustainability, safety, aesthetic appeal, and resource protection. Address major maintenance projects that are beyond the scope of routine maintenance. (See Map 4.2 for the Trail Reconstruction and Critical Road Crossings Map.)

New Trails. Construct sustainable trails to appropriate destinations and appropriate trail linkages in the overall trail system. Open Space and Mountain Parks seeks to provide trails to the most popular destinations while preserving visitor experiences and protecting

resources. Establish a process with public input for deciding dog access and management on newly-constructed trails. (See Map 4.3 for the Priority New Trails and Improvements Map.)

Undesignated Trails. Develop a program to assess undesignated trails, and take appropriate actions. These actions include: evaluating needs, and options, and perhaps, re-routing, closing, and reclaiming, or retaining and monitoring undesignated trails. (See Map 4.4 for the Trailhead and Trail Access Improvements Map.)

Trailhead Improvement. Construct or improve trailheads, possibly including:

- Parking lot function, design, access, and capacity
- Visitor infrastructure including trailhead boards, information and interpretive signs, restrooms, trash receptacles, and horse trailer or bicycle parking facilities
- Special facilities for persons who are mobility impaired

Trail Aesthetics. Redesign or relocate selected trails and trailheads to improve aesthetic appeal. The quality of visitor experience within natural and agricultural landscapes is affected by the appearance of trails and trailheads. In many cases, improvements can be made by redesigning existing trails and trailheads.

Transit Linkages. Popularize and improve transit linkages with existing Open Space and Mountain Parks trailheads and access points, whenever appropriate. Promote the use of alternate transportation modes by visitors to Open Space and Mountain Parks and minimize the impact of vehicle travel.

Volunteer Opportunities for Trail Construction and Maintenance. Open Space and Mountain Parks shall explore opportunities for local community groups and individual volunteers to participate in trail construction and maintenance projects, including managing on a test basis: (1) an annual community trail construction day or days; and (2) an "adopt-a-trail" program. Open Space and Mountain Parks shall also explore volunteer opportunities for habitat restoration.

5. Resource Protection Initiative

Visitor impacts that degrade or diminish the quality of natural, agricultural, and cultural resources should be minimized. The most significant potential impact from visitor activities is through visitor travel or access. This initiative is intended to: (1) direct visitors away from areas with highly sensitive resources; (2) direct visitors to areas where resource impacts can be minimized or avoided; and (3) set conditions on visitor access that will minimize or avoid resource impacts.

Management Strategies

Best Management Practices. Develop and implement trail and facility location, design, construction, and maintenance best management practices to avoid, reduce, and minimize impacts on the natural environment. These impacts include degradation of habitat qualities, trampling of vegetation, soil erosion and compaction, the spread of non-native plant species, and others. Locate and design trails to provide a travel route and travel experience that encourage users to stay on-trail and avoid off-trail travel.

On-Trail Requirements. Require visitors to stay on the trail in Habitat Conservation Areas and encourage on-trail travel in all management areas. Habitat Conservation Areas are the largest blocks of habitat with relatively intact and functional ecosystems. To a great extent, the

absence of high trail and road density contributes to this ecological integrity. In order to provide a high level of habitat protection and preserve these large habitat blocks, all visitor travel is required to be on-trail in Habitat Conservation Areas (unless approved through an off-trail permit). Requiring and encouraging on-trail visitor access is a key strategy for resource protection. On-trail visitor travel minimizes vegetation trampling, soil erosion, spread of weeds, and disturbance or displacement of wildlife.

Dogs-on-Leash Requirement. Require dogs to be on-trail and on-leash in Habitat Conservation Areas to provide a high level of habitat protection and preserve large habitat blocks. This will be the default management strategy. Dogs also may be prohibited within Habitat Conservation Areas.

Exceptions will be considered to on-leash requirements in Habitat Conservation Areas to meet special circumstances. These may include seasonal restrictions, on-corridor voice-and-sight dog management, no dogs, and others. The corridor width for on-corridor voice-and-sight control is 20 feet on either side of the designated trail.

Nighttime Curfews. Continue nighttime parking curfew and encourage a nighttime curfew in Habitat Conservation Areas. This action aims to provide a higher level of resource protection in Habitat Conservation Areas. It is intended to reduce visitor use and impact on wildlife sensitive to human presence during the nighttime hours, since many animals use nighttime as solace and refuge from humans.

Commercial Use Management. Implement a commercial use permit program consistent with city-wide policy.

- Permit proposed commercial activities that are compatible with protection and preservation of Open Space and Mountain Parks lands and resources and that support Open Space and Mountain Parks values.
- Direct commercial uses to appropriate sites and locations, which can adequately handle the activity impacts.
- Minimize the impact of the approved activity on the safety and quality of other visitors' experiences.
- Minimize the impact of the approved activity on natural, agricultural, and cultural resources.
- Promote the Leave-No-Trace ethic to permitees and activity participants.

Fees will be imposed to recover the costs of permit processing, oversight, and management. Permit conditions are placed on the activity to minimize impact. Open Space and Mountain Parks will work with community members and stakeholders to provide input for the development of the details of the program (e.g., profit vs. non-profit fees, size of operation, types of impacts, on/off trail, busy vs. down use times, etc.).

Commercial uses are defined as any activity on Open Space and Mountain Parks lands or facilities for which fees are charged for services and which bring people to Open Space and Mountain Parks lands. Commercial uses may be provided by either for-profit or non-profit providers. Examples include guided activities (climbing, hiking, nature study, photography, fishing, horseback riding, bicycle riding, and environmental education) and commercial filming. Commercial use permits will provide a discretionary approval process for any commercial use or service. For more detailed information on commercial use permits, see the Plan Reference Documents (available on the Visitor Master Plan page at www.osmp.org).

Localized Protection Measures. Implement wildlife closures (e.g., in the vicinity of raptor nests or concentrated large mammal feeding areas) and resource protection closures (e.g., muddy conditions) as needed and establish adequate regulatory authority. Closures are activated seasonally or temporarily to protect wildlife and people from each other or prevent resource damage by visitors.

New Property Planning and Facilities. Complete planning and infrastructure improvements in a timely manner, prior to opening newly acquired properties to public access. However, as appropriate, preserve existing public access during the planning and improvement process. Open Space and Mountain Parks will complete a site management plan recommending appropriate locations, types of uses and visitor infrastructure, and how to provide adequate visitor infrastructure and services. The timeline for completing plans and infrastructure improvements will be developed by Open Space and Mountain Parks staff and the Open Space Board of Trustees as part of annual work plans for implementing the Visitor Master Plan. Management plans will be considered by the Open Space Board of Trustees. An enforceable regulation to close properties to the public until these requirements are met will be developed and adopted. Open Space and Mountain Parks will communicate area regulations to the public using maps, signs, its website, and other means as appropriate.

Assessment of New Recreational Activities. Implement a process to determine whether or not "new" recreational activities or uses are passive and appropriate on Open Space and Mountain Parks lands. As part of the Visitor Master Plan, an activity assessment was performed to determine what conditions should be placed on existing passive recreational activities, or what infrastructure improvements should be made to ensure acceptable visitor and resource impacts. This review resulted in several recommended Management Strategies incorporated into the Visitor Master Plan.

A formalized oversight process will be defined and implemented to: (1) evaluate "new" recreational activities or uses to determine whether or not they should be allowed on Open Space and Mountain Parks lands; and (2) determine necessary conditions or infrastructure to avoid or minimize impact. "New" activities or uses include completely new types of recreation (possibly using new technologies), new locations for existing types of recreational activities, or substantially increased levels of a previously evaluated and approved activity. In order to prevent degradation in visitor experience or resource conditions, it is important that a passive recreation determination be conducted before or soon after a new recreational activity appears. Initiation of this determination process may be proposed by Open Space and Mountain Parks staff, the Open Space Board of Trustees, or members of the public.

Cultural Resource Management. Complete an inventory and vulnerability assessment of Open Space and Mountain Parks' cultural resources and implement various ways of increasing protection of cultural resources such as curation, stabilization, physical improvements, and restoration.

6. User Conflict Reduction Initiative

The following actions are intended to minimize conflicts between visitors and promote good recreational experiences for all visitors.

Management Strategies

Trailhead Dog Leash Requirement. Require dogs to be on-leash at selected trailheads. Open Space and Mountain Parks will require that dogs be leashed at selected trailheads where

visitor congestion and conflict are significant problems. This dog management program is intended to: decrease conflict among dogs and with other trail users; reduce safety hazards in trailhead parking areas; decrease off-trail trampling in the vicinity of the trailhead; and increase compliance with existing requirements for dog control, dog handler possession of a leash, and dog waste pick-up. In the development and implementation of this program, Open Space and Mountain Parks could decide that some trailheads may not need this on-leash restriction.

- The size and configuration of the on-leash area will fit the specific physical layout and management needs of specific trailheads.
- Implement this program with a pilot project to test the benefits and feasibility of dogs on-leash at trailheads. If successful, this program may be made permanent and applied to other selected trailheads.

Bicycling Compatibility. Work with community groups to reduce potential conflicts between bicyclists and other visitors.

Special Use Permits. Lower the special use group size threshold to 25 or more participants and require greater oversight of educational group activities, in order to reduce visitor and resource impacts.

- Require all groups with 25 or more participants to obtain a special use permit, with appropriate conditions to avoid, minimize, or mitigate impacts.
- Formalize and streamline the permit process to minimize the time commitment of applicants and staff. Annual permits may be issued for repeat visits.
- For school groups with 25-49 participants, require only Open Space and Mountain Parks notification and communication of visitation guidelines; for 50 or more require a permit.
- Evaluate the effectiveness of changes in the special use permit process. If needed, consider different group size thresholds for special use permits that vary by type of management area.

Special Use Permits. Special use permits are required for passive recreational activities with 25 or more participants or any event that may require an exemption from any existing policies or regulations. Examples of special uses include group hikes/rides, group picnics, and weddings. Permits are a means to: (1) approve special uses with conditions that can bring impacts to within an acceptable level; (2) direct special uses to alternate sites that can adequately handle the impacts of the activity; and (3) disallow special uses that create unacceptable impact. Reservations for Open Space and Mountain Parks shelters are not considered special events. Reasonable fees may be collected to partially cover the cost of administering the special use permit program. For more information on the special use permit program, see Plan Reference Documents (available on the Visitor Master Plan page at www.osmp.org).

Competitive Events. The Open Space and Mountain Parks Department shall not authorize competitive events on Open Space and Mountain Parks lands. The Department will establish regulatory authority prohibiting competitive events.

7. Public Involvement Initiative

Open Space and Mountain Parks will seek partnerships with community groups to develop support for management policies and programs, infrastructure investment, and resource protection--all aimed at improving the quality of the visitor experience and resource conditions.

Management Strategies

Annual Public Forums. Provide public "open dialogue" forums at least once a year to coincide with the timing of Open Space and Mountain Parks assessment of monitoring results and formulation of the annual work plan, budget, and capital improvements program development. This type of community consultation process is intended to provide fresh ideas, feedback on what is working and what is not, and discussion of priorities. It will also help Open Space and Mountain Parks refine its management strategies and change the course of ongoing implementation efforts.

Present project updates to the Open Space Board of Trustees and other community forums as appropriate on a regular basis. Work with the Open Space Board of Trustees to provide additional effective opportunities for community input. Use community survey results to track community attitudes, values, desires, and trends, which help inform implementation decisions for the Visitor Master Plan.

Hold two public meetings within 18 months of Visitor Master Plan approval to:

- Present and discuss the first-year Visitor Master Plan implementation work plan
- Present results of first year's monitoring one year after plan approval
- Present and discuss next year's Visitor Master Plan implementation work plan

Community Group Liaison. Designate an Open Space and Mountain Parks community liaison position that would provide a single point of contact for community groups to provide input to Open Space and Mountain Parks. The position will help provide ongoing working relationships that foster trust and collaboration. Other staff will have a liaison role to specific community groups, in coordination with the recreation liaison position. The intent is to create long-term working relationships between Open Space and Mountain Parks and community groups.

Issue-Based Community Collaboration. Use issue-specific, short-term task groups as needed. Possible tasks or projects:

- Devising specific details for programs like special use permits, commercial use permits, and off-trail permits in Habitat Conservation Areas
- Developing criteria, evaluating, and determining the status of undesignated trails
- Developing partnerships for trail construction and maintenance
- Developing priorities and designs for major trailhead improvements
- Developing monitoring protocols and implementing a monitoring program
- Guiding problem-focused research studies
- Devising pilot programs like dog certification and dogs on-leash at trailheads
- Evaluating bicycling options west of State Highway 93
- Designating specific use areas for hang gliding/paragliding, fishing, model glider flying, orienteering, etc.

Community Meetings. Conduct periodic meetings with community groups and the public to "check in" on plan implementation and adjust as necessary.

Volunteerism. Foster volunteerism as an important component of public involvement.

Management Areas: A Geographic Framework for Implementing the Plan

Open Space and Mountain Parks will use an area management system as a framework for implementing Visitor Master Plan implementation strategies. Key policies, programs, and projects are targeted to area-specific needs throughout the system.

The Open Space and Mountain Parks area management system provides a framework for implementing management strategies and setting priorities for visitor infrastructure improvements and service delivery. Under the umbrella of area management, certain key policies, programs, and projects are targeted to area-specific needs in different parts of the Open Space and Mountain Parks land system. Area management defines the geographic context for deciding which visitor activities are most suitable in a given area and what conditions will minimize impacts on other visitors or resources.

Protection, preservation, and management of city lands and provision of passive recreation opportunities, as defined by the City Charter, are fundamental goals for the Open Space and Mountain Parks Program. Management area designations define a management emphasis for different areas within the Open Space and Mountain Parks land system, based on a primary open space purpose (e.g., provision of quality passive recreational opportunities, preservation of agriculture, and protection and restoration of natural systems). The management designation defines suitable visitor activities in each type of area and under what conditions those activities can occur. The management designation also defines the management strategies needed to enhance visitor experience and ensure compatibility of visitor activities with resource protection.

Specific management strategies are applied in a given management area. The set of strategies applied in a given management area is based on the land characteristics (e.g., physical and ecological qualities, existing and anticipated visitor use patterns, existing and potential visitor infrastructure, and others) and the management needs that exist in that area. A flexible approach for applying strategies to a given management area is necessary, as exceptions may be needed to meet special circumstances.

A Description of the Open Space and Mountain Parks Management Area Designations

The primary goal of area management is to encourage visitor use in areas that can best accommodate the use, which includes areas that can provide a high-quality visitor experience and ensure compatibility of visitor use with natural, agricultural, and cultural resources. Areas with highly vulnerable resources require a higher level of protection: directing people away from sensitive resources, placing conditions on the use that avoids or minimizes impact, or providing visitor infrastructure to ensure acceptable levels of impact.

The quality of the environment--the "naturalness" of an area--is the foundation of the recreational experience on Open Space and Mountain Parks lands. Consequently, both the quality of the environment, and the quality of visitor experience, should be preserved and maintained in all Open Space and Mountain Parks management areas.

Four management area designations are defined on Open Space and Mountain Parks lands: Passive Recreation Areas, Natural Areas, Agricultural Areas, and Habitat Conservation Areas (see Map 4.5). These management area designations provide the overall context for how visitor

activities should occur. See Map 4.6 for a delineation of dog management strategies applied within management areas. Management areas are delineated for each of the designation categories. The characteristics, goals, and criteria used to delineate the management areas are described below.

Passive Recreation Area Designation

Characteristics

- Generally in close proximity to city or county development.
- Higher level of visitor use and density of existing trails.
- More evidence of human use and impacts.
- May include some interspersed patches of high-quality habitat.

Goals

- Provide a high level of public access to destinations and connection through designated trails.
- Maintain or improve passive recreational and educational opportunities, while protecting and preserving natural lands and resources.
- Accommodate high levels of visitor use with appropriate management, trails and trailheads, and services.
- Reduce conflicts among visitor activities.
- Minimize the number of undesignated or "social trails;" eliminate undesignated trails when they are duplicative or damaging to resources.

Criteria for Inclusion of Management Areas in the Passive Recreation Area Designation

- Higher level of visitation.
- Trails and trailheads that accommodate high levels of visitor use.
- High density of trails.
- Offers destinations for a wide range of different passive recreational activities.
- Compatibility with adjacent land use (i.e., opportunities to coordinate with neighboring or nearby landowners/managers in providing recreational services).

Natural Area Designation

Characteristics

- Locations can be both close to and remote from development.
- Varying levels of visitor use, types of activities, and availability of facilities.
- Conditions of natural ecosystems are variable--many areas with ecological systems in good condition, some with evidence of human use and impacts.
- May be in proximity to agricultural production and operations.

Goals

- Accommodate low-impact visitor activities where adequate trails exist or can be built, and resource impacts can be minimized.
- Provide opportunities for passive recreational and educational activities that require topographic relief or a natural setting (e.g., hang/paragliding, climbing/bouldering, nature study, scenic viewing).
- Protect the quality of natural and agricultural resources (especially where high value resources exist).
- Eliminate undesignated trails when they are redundant or damaging to resources.

Criteria for Inclusion of Management Areas in the Natural Area Designation

- Interspersed recreational and natural values require that management determine the appropriate mix of open space purposes and manage multiple uses accordingly.
- Relatively high resource and recreation values.
- Compatibility with adjacent land use (i.e., opportunities for coordinating habitat protection and connections and passive recreational activities/trail linkages).

Agricultural Area Designation

Characteristics

- Rural areas in the Boulder Valley.
- May be in proximity to areas of either high or low visitor use.
- Areas of intensive agricultural production or operation.

Goals

- Maintain the efficiency of agricultural production and operation.
- Manage agricultural production and operation to ensure safety for operators and visitors in the vicinity.
- Provide, where appropriate, public access and passive recreational opportunities that have minimal impacts on agricultural production and operation or other resources.
- Manage visitor access in areas of intensive agricultural production or operation to ensure visitor safety.
- Eliminate undesignated trails when they are redundant or damaging to resources.

Criteria for Inclusion of Management Areas in the Agricultural Area Designation

- Crop production and irrigated hay fields and grazing areas.
- Areas where conflicts with visitors and their pet companions could or do adversely affect the efficiency of agricultural production and operations or endanger visitor safety.
- Compatibility with adjacent land use (i.e., opportunities for coordinating agricultural protection and recreational activities/trail linkages).

  Note: Areas of concentrated livestock activity (corrals, horse boarding, etc.), private residences, machinery storage areas, etc. will be addressed in a separate policy.

Habitat Conservation Area Designation

Characteristics

- Tend to be located in more remote areas.
- Typically represent the largest blocks of an ecosystem type with few, if any, trails or roads.
- Lower level of visitor use; no or few trails and trailheads.
- Naturally functioning ecosystems (but may contain areas with evidence of human use and impacts).

Goals

- Maintain, enhance, and/or restore naturally functioning ecological systems.
- Maintain, enhance, and restore habitat for species of concern identified in the Boulder County and the Boulder Valley Comprehensive Plans.
- Provide public access and passive recreational opportunities that foster appreciation and understanding of ecological systems and have minimal impacts on native plant communities and wildlife habitats or other resources.

- Eliminate all undesignated trails, unless they are made part of the designated trails system or provide specialized access to appropriate low-use destinations.
- Where sustainable infrastructure exists, continue to allow public access to appropriate destinations.

Criteria for Inclusion of Management Areas in the Habitat Conservation Area Designation

- Large habitat blocks with a low density of trails, roads, or development.
- High potential for restoration of natural ecosystems (including areas with restoration underway).
- Plant communities that are rare or unique on Open Space and Mountain Parks lands.
- Habitat for species of concern such as threatened, endangered, rare, and other species.
- Areas with high biodiversity such as wetlands and riparian areas (especially un-trailed riparian reaches).
- Comparatively lower visitation levels.
- Compatibility with adjacent land use (i.e., opportunities for coordinating habitat protection and connections and recreational activities/trail linkages).

Management Area Strategies

The management strategies associated with each management area designation are summarized in Table 4.1.

Note: The following table identifies strategies **normally** applied in specific management area designations. (*That does not preclude localized application in any of the management areas where needed).*

Table 4.1: Management Strategies for Open Space and Mountain Parks Management Areas

Management Issue	Passive Recreation Area Strategies	Natural Area Strategies	Agricultural Area Strategies	Habitat Conservation Area Strategies
On-Trail Visitor Use **Note:** Management *in all areas* may include seasonal or local requirements for visitors to stay on-trail or seasonal/local closures to address environmental sensitivity or trail sustainability. All designated trails will be signed and indicated on trail maps.	Encourage on-trail use. Require on-trail use in sensitive areas and/or at specific times, unless an off-trail permit is obtained.	Encourage on-trail use. Require on-trail use in sensitive areas and/or at specific times, unless an off-trail permit is obtained.	Encourage on-trail use. Require on-trail use in sensitive areas and/or at specific times, unless an off-trail permit is obtained. Consider/provide designated on-trail access to selected destinations.	Require on-trail use except: (1) in a limited number of designated off-trail activity areas; or (2) if an off-trail permit is obtained for OSMP-sponsored activities or other limited and approved public use. Consider/provide designated on-trail access to selected destinations.

Table 4.1: Management Strategies for Open Space and Mountain Parks Management Areas				
Management Issue	**Passive Recreation Area Strategies**	**Natural Area Strategies**	**Agricultural Area Strategies**	**Habitat Conservation Area Strategies**
Trail Functions, New Trails, and Interconnected Trail System **Note**: In all management areas, OSMP will provide different classes of trails. Trail classes are matched to the specific travel needs / opportunities and the environmental context in a given area. Trails will provide different levels of access, offer different types of travel experiences / challenges, and use different physical designs and materials. Trails will accommodate different types and levels of use, but all are intended to accommodate use without undue maintenance demands and to minimize impacts on the environment. OSMP will make management decisions based upon the best available information and evaluate the appropriateness and effectiveness of management actions.	Build and maintain a hierarchy of trails that encourage visitors to travel on-trail and minimize impacts. New trails to important destinations will be considered. Improve and construct sustainable trail linkages to create an interconnected trail system.	Build and maintain a hierarchy of trails that encourage visitors to travel on-trail and minimize impacts. New trails to important destinations will be considered. Improve and construct sustainable trail linkages to create an interconnected trail system.	Minimize new trails and trail density; locate new trails to minimize impacts on agricultural operations. Consider designating/building trails that: • Do not impinge upon agricultural operations • Provide appropriate access • Include appropriate linkages and connections	Minimize new trails and trail density; locate new trails to minimize impacts on habitat quality. Consider designating/building trails that: • Do not impinge upon ecological systems • Provide appropriate access • Include appropriate linkages and connections
Trail Design for Level of Use	Design and construct trails and other facilities to sustain a <u>higher</u> level of visitor use.	Design and construct trails and other facilities to sustain a <u>variable</u> level of visitor use.	Design and construct trails and other facilities to sustain a <u>variable</u> level of visitor use.	Design and construct trails and other facilities to sustain a <u>low</u> level of visitor use.

Table 4.1: Management Strategies for Open Space and Mountain Parks Management Areas				
Management Issue	**Passive Recreation Area Strategies**	**Natural Area Strategies**	**Agricultural Area Strategies**	**Habitat Conservation Area Strategies**
Undesignated Trails	Lower priority for management of undesignated trails. Minimize new undesignated trails. Management actions for existing undesignated trails include: • Evaluate best management actions • Designate • Re-route • Close and reclaim • Retain undesignated trails • Monitor newly established or developing undesignated trails	Variable priority for management of undesignated trails. Minimize new undesignated trails. Management actions for existing undesignated trails include: • Evaluate best management actions • Designate • Re-route • Close and reclaim • Retain undesignated trails • Monitor newly established or developing undesignated trails	Variable priority for management of undesignated trails. Minimize new undesignated trails. Management actions for existing undesignated trails include: • Evaluate best management actions • Designate • Re-route • Close and reclaim • Retain undesignated trails	High priority for management of undesignated trails. Minimize new undesignated trails. Management actions for existing undesignated trails include: • Evaluate best management actions • Designate • Re-route • Close and reclaim
Access to Areas Normally Closed to Visitors	Provide guided educational hikes in areas normally closed to visitors.	Provide guided educational hikes in areas normally closed to visitors.	Provide guided educational hikes in areas normally closed to visitors.	Provide guided educational hikes in areas normally closed to visitors or require permits for off-trail use.

Table 4.1: Management Strategies for Open Space and Mountain Parks Management Areas				
Management Issue	**Passive Recreation Area Strategies**	**Natural Area Strategies**	**Agricultural Area Strategies**	**Habitat Conservation Area Strategies**
Dog Management	Visitors are strongly encouraged to keep dogs on-trail. Dog management is predominantly voice–and-sight control. Dogs on-leash, dogs prohibited, or seasonal dog requirements may be implemented.	Visitors are strongly encouraged to keep dogs on-trail. Dog management is predominantly voice-and-sight control. Dogs on-leash, dogs prohibited, or seasonal dog requirements may be implemented.	Visitors are strongly encouraged to keep dogs on-trail. Dog management is predominantly voice-and-sight control. Dogs on-leash, dogs prohibited, dogs on-corridor voice-and-sight control, or seasonal dog requirements may be implemented.	Dogs are required to be on-trail, with some exceptions allowing on-corridor voice-and-sight control. Dog management is predominantly on-leash. Dogs on-leash, dogs prohibited, dogs on-corridor voice-and-sight control, or seasonal dog requirements may be implemented.
Nighttime Use	Trailhead parking prohibited 11 p.m. to 5 a.m. (except Panorama Point and Halfway House).	Trailhead parking prohibited 11 p.m. to 5 a.m.	Trailhead parking prohibited 11 p.m. to 5 a.m.	Trailhead parking prohibited 11 p.m. to 5 a.m. and a nighttime curfew encouraged one hour after dusk to one hour before dawn.
Emphasis for Education and Enforcement Activities	Target educational and enforcement services to reduce visitor conflict, foster appreciation and protection of the OSMP environment, and support resource protection.	Target educational and enforcement services to reduce visitor conflict, foster appreciation and protection of the OSMP environment, and support resource protection.	Target educational and enforcement services to support on-trail visitor use and foster appreciation and protection of agricultural resources.	Target educational and enforcement services to support on-trail visitor use and foster appreciation and protection of natural resources.
Visitor Services and Facilities Matched to Level of Use	Provide a level of visitor services and facilities to support <u>higher use levels</u> and a quality visitor experience (interpretive signs, scenic pull-outs, picnic tables, toilets, etc.).	Provide a moderate level of visitor services and facilities.	Provide a variable level of visitor services and facilities matched to the levels of use encountered.	Provide a low level of visitor services and facilities, except those supporting basic protection and maintenance services.

The management areas within the Passive Recreation Area, Natural Area, Agricultural Area, and Habitat Conservation Area designations are listed in Table 4.2, and their boundaries are shown on Map 4.5. These management areas share a set of management strategies appropriate for different situational contexts.

Table 4.2: Management Area Designations and Management Areas on Open Space and Mountain Parks	
Passive Recreation Area Designation: Management Areas: • Western Boulder County • Lefthand Canyon • Boulder Valley Ranch • Wonderland • Sanitas Valley/Red Rocks • Elephant Buttress • Flagstaff/Chautauqua • South Mesa • West Marshall Mesa • Dry Creek • Gunbarrel/Heatherwood Passive Recreation Area	**Natural Area Designation: Management Areas** • Northern Tier • East Beech • Sanitas • Anemone Hill • Flatirons/Mountain Backdrop • Shanahan • Doudy Draw • East Marshall Mesa • South Boulder Creek • East Boulder • Creek Confluence • Valmont Reservoir • Diagonal • Gunbarrel/Heatherwood Natural Area • Outlots
Agricultural Area Designation: Management Areas • East Boulder Valley • North Boulder Valley	**Habitat Conservation Area Designation: Management Areas** • North Foothills • Western Mountain Parks • Eldorado Mountain • Jewel Mountain • Southern Grasslands • Tallgrass Prairie East • Sombrero Marsh • Cottonwood Grove • Lower Boulder Creek

Appendix 4.1 includes information on: the process used in developing the Open Space and Mountain Parks area management system, the specific criteria attributes that apply to each of the management areas, the relationship of management areas to Environmental Conservation Areas designated in the Boulder County Comprehensive Plan, and references to the documents and analyses that provide information about the management areas.

Appendix 4.1 also includes detailed information about the management areas, including: natural resources, recreational use, management issues, and recommended management actions.

Policies

Geographic Targeting. Delineate management areas that provide a framework for implementing area-specific policies, programs, and projects, based on the visitor use, infrastructure, and resource characteristics of each area.

Passive Recreation. Provide a higher level of visitor services and more durable facilities in those areas where accommodating passive recreation is emphasized.

Resource Protection. Provide a higher level of resource protection in those areas that are most vulnerable to adverse impacts from visitor use.

Variable Access. Designate management areas that help Open Space and Mountain Parks manage the land for varying purposes. To achieve this, a continuum of public access options will be implemented (e.g., on-trail or off-trail, seasonal or permanent) as well as dog management options (e.g., voice-and-sight control, on-leash, on-trail, on-corridor, seasonal or permanent).

Integration with Capital Improvements Program and Service Delivery Decisions. Integrate the varied management emphases of the different management areas into decisions on trail and facility improvements and changes in delivery of visitor services.

Management Actions

Phased Implementation. Begin phased implementation of the management areas and associated strategies and actions.

Education and Enforcement. Develop and phase in education and enforcement activities related to area management.

- Education and outreach activities will communicate the rationale and requirements for changes in visitor use allowed in various management areas (including media coverage, new signs, trailhead board information, brochures, Open Space and Mountain Parks website, public presentations, etc.). A Visitor Master Plan public outreach program will be created that specifically includes information about the area management system.
- Enforcement activities will be designed to induce compliance with new area management requirements.

Integration with Capital Improvements Program and Service Delivery Decisions. Integrate the management emphases of the different management areas into decisions on trail and facility improvements and changes in delivery of visitor services.

Regulatory Changes. Make regulatory changes that will implement the area management requirements.

Chapter

5

Monitoring and Performance Measures

The Visitor Master Plan establishes standards for several key services that support and enhance the experiences of visitors and protect the natural values of the Open Space and Mountain Parks lands. Success in providing these community services is defined as making meaningful progress toward a sustainable and high quality visitor experience.

The monitoring program for the Visitor Master Plan is designed to measure success by answering three key questions:

Is the quality of the visitor experience being maintained or enhanced?

Are impediments or threats to sustainable management being addressed?

Are partnerships successfully involving the community in decision-making and stewardship?

Monitoring

- Provides information needed to assess progress toward achieving management goals.
- Should measure both the conditions "on the ground" and the status of impediments that prevent achieving management goals.
- Provides information that enables Open Space and Mountain Parks to adjust or change actions or behaviors, thereby adapting to changing conditions.

The monitoring program incorporates measures that are reliable and sensitive to change. Reliability is based upon an understanding of cause-and-effect relationships for a particular situation or phenomenon. The monitoring plan may include research to validate these models--especially those that are least certain.

The proposed adaptive management framework in the Visitor Master Plan is based upon three levels of monitoring:

Implementation--"Did we do what we said we were going to do?"
Effectiveness--"Did our strategies and actions have the intended effect?"
Research--"Did the system respond according to our predictive models?"

Implementation monitoring includes tools for tracking and documenting completion of individual projects to create an annual record of accomplishment. Implementation monitoring can identify programs that are feasible and working and those that need to be modified or discontinued. As new management needs arise, implementation monitoring will provide a clear understanding of the actions taken and allow an informed response for allocating resources and funding.

Effectiveness monitoring is used to address both direct and indirect effects of Open Space and Mountain Parks actions. For some services, the relationship between what

Open Space and Mountain Parks does and the effect or outcome is well understood. In other cases, less certainty exists about the cause-and-effect relationships between management actions and the desired effect or outcome.

Determining and analyzing cause-and-effect relationships can be complicated. **Research** may be required to separate a large number of interconnected factors that contribute to a problem or certain situation. Scientific research is usually expensive and requires a long-term commitment to provide meaningful results.

Collaboration with the community is an important part of the Visitor Master Plan monitoring program. The Open Space and Mountain Parks Department will seek partnerships with other land and resource management agencies, community groups, and interested members of the public to measure the success of Visitor Master Plan implementation. A staff research committee will identify key research and data needs and issue an annual "call for proposals." Issue-specific or ad hoc groups may be assembled on a short-term basis to examine research results and help resolve management issues. Periodic "state-of-the-system" updates and annual reports to the community will facilitate information exchange and help determine future priorities.

Monitoring, Performance Measures, and the Visitor Master Plan Initiatives

The Visitor Master Plan describes seven community initiatives that deliver **services** (Chapter 3) to Open Space and Mountain Parks visitors and the community through a package of **strategies** (Chapter 4). This chapter describes **performance measures** that enable Open Space and Mountain Parks to assess progress toward implementing those strategies and meeting the Visitor Master Plan goals and objectives.

The Visitor Master Plan initiatives are:

1. Education and outreach
2. Safety and enforcement
3. Recreational opportunities
4. Trails and facilities
5. Resource protection
6. User conflict reduction
7. Public involvement

Priority Monitoring Projects and Performance Measures

Each of the seven initiatives will be monitored. Implementation monitoring will be comprehensive. Open Space and Mountain Parks will track strategy implementation and project completion. The Program will prioritize effectiveness monitoring, selecting certain key services and strategies to insure that our actions are having the intended effect. Performance measures for implementation and effectiveness will be presented in periodic reports to the Open Space Board of Trustees, the City Council, and the community.

Research priorities will be identified when a lack of understanding keeps the Open Space and Mountain Parks Department from making forward progress toward Visitor Master Plan goals. The Department will work with the professional research community, as well as resource management, visitor use, and conservation organizations to develop and answer "problem-focused" and practical research questions.

Monitoring will be integrated into annual work planning, which is based on identified work priorities, staffing levels, and available funding.

Monitoring Project Descriptions

Monitoring project descriptions for the seven initiatives are listed below. Each monitoring project description includes a list of implementation measures that will be tracked and reported. **Effectiveness measures** are shown with the frequency and timing for monitoring each measure, the current estimate of the measure (if available) and the proposed standard.

Questions to measure effectiveness also will be included in surveys of residents and visitors. Open Space and Mountain Parks will periodically conduct surveys to assess public perception. Community residents will be surveyed about how the Open Space and Mountain Parks Program is meeting their expectations. Visitors to Open Space and Mountain Parks will be asked their opinions on a variety of issues related to their use and enjoyment of Open Space and Mountain Parks.

Education and Outreach Initiative

Implementation Monitoring

- Assess educational information and materials
- Track and report numbers, locations, and topics for public contacts, programs, and volunteer hours
- Compile and document environmental educational materials and programs

Effectiveness Monitoring

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Outreach Evaluation Percent of visitors surveyed who characterize outreach effort as “of high quality” or “welcoming”	Every other year On-going	n/a	90%
Education Evaluation Percent of educational program participants who are very satisfied with environmental education programs and public programs	Every other year On going	n/a	90%
Volunteer Satisfaction Percent of volunteers who are very satisfied with their volunteer opportunity	Every other year On-going	n/a	90%

Safety and Enforcement Initiative

Implementation Monitoring

Track and report:

- Emergencies, natural hazards, and potentially unsafe conditions
- Projects to resolve hazards associated with road crossings and roadside parking hazards
- Development and revision of ordinances needed for implementing the Visitor Master Plan
- Number of warnings and summonses for violations of visitor use-related regulations
- Document safety standards as well as inspection and response procedures for structures, agricultural operations, and natural hazards

Effectiveness Monitoring

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Frequency of Accidents Number of avoidable safety related incidents	Annual On-going	n/a	0
Response Lapse Time lapse between potential hazard brought to OSMP's attention and OSMP's response	Annual On-going	n/a	< 24 hrs.
Type Type of safety-related incidents	Annual On-going	Tracked to better direct facilities and services	
Location Location of safety related incidents	Annual On-going	Tracked to better direct facilities and services	
Patrol Properties patrolled to established standards	Monthly On-going	n/a	Meet patrol standards at least 90% of the time
Compliance with "on-trail" regulation	Annual For 1-3 years	n/a	90%
Compliance with dog control and excrement removal requirements	Annual For 1-3 years	n/a	90%

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Survey Questions			
How safe do you feel during your visits to OSMP?	Survey conducted every other year On-going	98%	95-100%
Reasons for feeling safe/unsafe		Tracked to better direct facilities and services	

Recreational Opportunities Initiative

Implementation Monitoring

Track and report:

- Completion of accessibility improvements for the disabled
- Identification and evaluation of routes for bicycling to be considered for future designation or construction
- Identification and evaluation of potential launch sites for hang/paragliding to be considered for future designation or construction
- Designation of areas for off-trail activities
- Proposals and Open Space and Mountain Parks decisions regarding climbing bolt placement and replacement
- Completion of plans and infrastructure improvements on newly acquired properties
- Compatibility reviews completed for “new” activities.
- Implementation of new policies for special uses and commercial uses
- Implementation and review of dog management policies, including the voice-and-sight control demonstration project and additional no-dog opportunities on some trails

Effectiveness Monitoring

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Survey Questions			
How would you rate your ability to access the destinations you would like to visit on OSMP? Using scales: A-F (resident survey) or Very Adequate, Somewhat Adequate, Somewhat Inadequate, Very Inadequate (visitor survey)	Every other year (resident) As part of visitor survey On-going	n/a	B or 90%** **Respond “somewhat adequate” or “very adequate”

Trails and Facilities Initiative

Implementation Monitoring

Track and report:

- Completion of capital improvement projects (trail construction, designation, reclamation)
- Development of standards for temporary trail closures
- Development of evaluation criteria and process for new trails
- Development of evaluation criteria and process for undesignated trails

Effectiveness Monitoring

Monitoring Measure	**Frequency and Timing of Monitoring**	**Current Status**	**Proposed Standard**
Maintenance Condition: Trails An aggregate measure which includes: grade, clearance, % change in width, compaction, erosion, undesignated trails, and braiding.	Annual On-going	Vary by trail segment	Trails kept in acceptable condition by regularly scheduled maintenance
Maintenance Condition: Trailheads An aggregate measure which includes: cleanliness and condition of trailhead infrastructure.	Annual On-going	Vary by trailhead	Trailheads kept in acceptable condition by regularly scheduled maintenance
Maintenance Condition: Facilities An aggregate measure which includes: Structural integrity, exits, security, integrity of utility systems, hazardous materials, associated machinery, signs, paint.	Annual On-going	Vary by facility	Facilities kept in acceptable condition by regularly scheduled maintenance
Miles of undesignated trails	Partial: Annual Complete: every 5 years On-going	305 miles	Less than 50 miles
Miles of new undesignated trails	Every 5 years	n/a	0 miles
Survey Questions			
Quality of facilities and services. (Resident Survey)	Every other year On-going	93% Responding: Good or Excellent	90-100%

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Trail Condition and Maintenance	Every other year	n/a	B
(Visitor Survey)	On-going	On a grading scale from A-F	

Resource Protection Initiative

Implementation Monitoring

Track and report:

- Review of educational materials and activity-groups' codes of ethics for appropriate content regarding invasive exotics
- Identification and establishment of areas within any of the management zones that may require local protection measures
- Identification of areas where environmental conditions and patterns of visitor use suggest that temporary closures would effectively protect Open Space and Mountain Parks resources
- Development and application of Best Management Practices for environmental protection
- Completion of cultural resource inventories

Effectiveness Monitoring

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Change in streamside and wetland cover trampled	TBD On-going	5-50%	5%
Percent change in baseline cover for selected trailside shrub stands	TBD Ongoing	15-50% decrease in baseline cover	No more than 1-5% loss
Percent change in cover/abundance of sensitive species in selected locations	TBD On-going	n/a	0% loss of individuals or No more than 1-5% decrease in baseline cover or abundance
Density of trailside occurrences of selected rare species	TBD On-going	Density reduced less than 5%	No more than 5% reduction in density from established baseline
Compliance with raptor closures	Annual On-going	n/a	100%
Compliance with bat closures	Annual On-going	n/a	100%

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Compliance with bear closures	Annual On-going	n/a	90-100%
Non-native species cover, number of species at trailheads, areas of concentrated visitor use, and along trails (grassland)	TBD On-going	10-25% cover 3-5 exotic indicator species present	0-10% non-native cover fewer than 3 indicator species present
Percent canopy cover of highest priority weeds at trailheads, areas of concentrated visitor use, and along trails (grassland)	TBD On-going	0-5%	0-5%
Percent cover, # infestations trail-related highest priority weed species (forest)	TBD On-going	15-50%	5-15%
Compliance with dog control requirements	TBD 1-3 years	65%	90%
Compliance with on-trail requirement	TBD 1-3 years	n/a	95%
Number of dog/livestock incidents	Annual On-going	Variable	< 1/month on average
Condition of selected cultural resources	TBD On-going	n/a	TBD

User Conflict Reduction Initiative

Implementation Monitoring

Track and report:

- Development and dissemination of codes of ethics for various user groups
- Implementation of video/tag program
- Development of voice-and-sight control certification program
- Develop questions for resident and visitor surveys to measure types, location, and frequency of conflicts among visitors
- Observe and report periodically on selective visitor behaviors to assess regulation compliance, visitor conflict reduction, and overall visitor use patterns

Effectiveness Monitoring

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Percent of dogs off-leash "participating" in dog management video/tag program	Annual On-going	n/a	90%
Compliance with trailhead leash and dog excrement pick-up requirements (observational studies)	Annual On-going	n/a	TBD

Public Involvement Initiative

Implementation Monitoring

Track and report:

- Assignment of staff as liaisons with community groups
- Public meetings held to review Visitor Master Plan updates and annual reports
- Public process for issue specific or *ad-hoc* projects
- How public input is integrated into the annual work program

Effectiveness Monitoring

Monitoring Measure	Frequency and Timing of Monitoring	Current Status	Proposed Standard
Survey Questions			
Questions [to be developed] to assess the effectiveness and adequacy of communication about implementation of the Visitor Master Plan with staff, the Open Space Board of Trustees, and City Council	Every 2 years On-going	n/a	TBD

Chapter

6

Funding and Scheduling

Investment Strategy

The Open Space and Mountain Parks investment strategy focuses first on maintaining and operating the designated trail system and providing basic visitor services and resource protection, and, second, on completing deferred maintenance and trails planning for undesignated trails and priority new trails. Remaining available funds will be used to build priority new trails. This strategy protects the extensive public investment in existing facilities, ensures the safety and integrity of the system, delivers an improved visitor experience, and reduces resource impacts. Three capital funding investment programs are presented that protect the long-term community investment and provide multiple community benefits.

Investment policies guiding the priorities for funding are:

- **Highest priority**--visitor system, operation, maintenance, resource protection, trail planning, and review of undesignated trail status
- **Next priority**--deferred maintenance, high priority new trails
- **Lower priority**--additional visitor enhancements, lower priority new trails

Three capital funding investment programs are described that bridge the direction provided in the Boulder Valley Comprehensive Plan with the city's capital budget: **Current Funding, Accelerated Funding, and Identified Need**. The three capital funding investment programs identify various funding levels to accomplish the goals of the Visitor Master Plan over the six-year planning timeframe:

- **Current Funding Investment Program** $3.5 million ($583,000/year)
- **Accelerated Funding Investment Program** $4.2 million ($700,000/year)
- **Identified Need Investment Program** $4.9 million ($817,000/year)

Approximately 20% of the 2005 budget ($3.9 million) is allocated to implementing the Visitor Master Plan. This includes capital (shown above) in the Current Funding Investment Program and non-capital expenditures (including standard employees, fixed-term employees, seasonal employees, and equipment and materials).

The Accelerated Funding Investment Program is a hypothetical scenario that reflects a funding level for capital projects that is mid-way between the Current Funding level and the projected Identified Need funding level. A funding level difference of $1.4 million is projected between the Current Funding and Identified Need levels. The mid-point between these funding scenarios of $700,000 was selected as part of the funding analysis presented in the Visitor Master Plan.

The Identified Need Investment Program represents a funding level that is necessary to complete all of the capital projects identified in the Visitor Master Plan over the six-year capital improvements program (CIP). Completion of the capital infrastructure program in the Identified Need Investment Program is expected between 2005 and 2010 based on projected budgets and revenues.

The Open Space and Mountain Parks Program is publicly funded, primarily through local sales tax revenues. Sales tax revenues are dependent upon the strength and vitality of the local economy.

Sales tax revenues drop when the local economy slumps. The capacity to implement a **reduction strategy** is necessary in this changing economic climate. For example, in order to address negative revenues from 2001 through 2003, the Open Space and Mountain Parks Department adopted a strategy of funding the basic maintenance and operational services, re-allocating staff and funds to core services, achieving sustainable reductions over time together with one-time reductions, continuing to gain efficiencies in all service areas, and keeping matching funds in priority projects funded by grants. Funding for the Department has improved starting in 2004 with collections from the 0.15 cent sales tax increase and in 2005 with the turnaround in sales tax collection trends from negative to positive. It is important for the Department to continue to aggressively pursue and adopt goals while retaining preparedness to respond to economic conditions.

Current Funding Investment Program

The Visitor Services Capital Improvements Program ($250,000 annually) and Lottery Funds ($269,000 in 2005) are funding sources currently used for capital expenditures. Under the Current Funding Investment Program priorities identified for visitor infrastructure capital improvement projects (CIP) in the Trails Assessment Report (City of Boulder 2004c) could be completed in approximately eight years.

Major capital projects and non-capital projects are identified in the project scheduling section. Spending at the Current Funding level will meet many of the project priorities between 2005 and 2010, but require a longer time period to complete all identified capital and non-capital projects.

Accelerated Funding Investment Program

As additional funds are available between 2005 and 2010, they will be considered for allocation to implementing the Visitor Master Plan.

The Accelerated Funding Investment Program is an increase in funding above the Current Funding Investment Program. This additional funding will increase the capacity of the Open Space and Mountain Parks Department to complete undesignated trail assessments, fix eroding trails more quickly, correct infrastructure deficiencies by doing more deferred maintenance, and improve additional visitor facilities such as trailheads.

Identified Need Investment Program

The Identified Need Investment Program funding level reflects a Capital Improvements Program that will complete all identified priority capital improvement projects in the Trail Assessment Report, including routine maintenance, deferred maintenance, evaluation and designation of undesignated trails, and construction of all high priority new trails by 2010. Funds required for all capital projects are estimated at $4.9 million.

Funding for the Identified Need Investment Program is approximately 40% greater than funding in the Current Funding Investment Program. The Identified Need Investment Program increases the funding level by $1.4 million more than the Current Funding Investment Program. Starting in 2006, an additional $250,000 per year, or $1.5 million over the Capital Improvements Program planning horizon, has been requested for reallocation from fund balance for this purpose.

Funding

Capital funding for implementation of the strategies to provide community services identified in the Visitor Master Plan is outlined in the capital funding investment programs. The Visitor Master Plan describes a realistic and fully-funded plan that details what is spent and what is accomplished. The Current Funding Investment Program is based on current (2005) funding levels, primarily from city sales tax revenues (see Chapter 2, Current Open Space and Mountain Parks Funding). The Open Space sales tax contributes 93.2% of the current funding. The city General Fund is the source of 4.9% of the current budget. Another 1.3% of the current budget is a share of the Colorado Lottery contribution to the city of Boulder. The Identified Need Investment Program is based on using a mixed-funding approach of dedicated funds augmented when necessary by external funds and grants.

Future Funding Plan

Open Space and Mountain Parks will use several funding options to develop a realistic funding plan for the future that includes the following annual budgeting targets:

- Continued budgeting of city sales tax revenues (Open Space Fund) and city General Fund
- Annual grants from public (state and federal) and private sector sources for selected projects
- Increases in annual city sales tax revenues available for allocation to visitor infrastructure projects and resource protection and restoration
- Approximately $269,000 of Lottery funds annually, re-allocated under agreement of the Open Space Board of Trustees and the Parks and Recreation Advisory Board

Capacity-Building

The investment and funding strategies are dependent on sufficient organizational capacity to implement and achieve the goals of the Visitor Master Plan. The Visitor Master Plan provides the basis for the Open Space and Mountain Parks Department to determine what additional funding and staffing are necessary to achieve the goals of the Visitor Master Plan. The following actions target the efficient use of funds and staffing.

Develop and Use Service Standards and Performance Measures. Develop and implement service standards that define actionable targets for desired visitor experience, visitor infrastructure, and resource conditions. These service standards will guide decisions regarding appropriate levels of service, infrastructure, and resource protection. Performance measures provide a means of measuring progress in meeting the targets over time (see Chapter 5).

Increase Interagency Cooperation. Cooperate with other agencies to pursue shared interests, especially when management challenges and opportunities cross agency boundaries. This cooperation will include ongoing communication, information sharing, coordinated management actions, and other activities.

Develop Partnerships for Funding and Management. Develop partnerships that support mutual responsibilities for land management, including shared commitment of staff time to address mutual issues, joint capital improvements, compatible regulations, joint grant applications, and other programs and projects.

Improve Effectiveness and Compatibility of Management Actions. Ensure the compatibility of management actions affecting visitor use with other types of management actions. Open Space and Mountain Parks will strive to make various policies, programs, and operations as consistent

and effective as possible (e.g., management of visitor activities, resource conservation activities, and agricultural operations).

To accomplish the actions outlined above, the Open Space and Mountain Parks Program will consider the following.

- **Evaluate current staffing and funding levels** to meet Visitor Master Plan priorities and make changes as appropriate.

- **Fund staff training and service contracts** to improve capabilities needed to implement the Visitor Master Plan. New staff expertise may be needed to effectively implement the Visitor Master Plan. Some expertise may be best acquired by hiring consultants or contractors.

- **Transfer ownership or management responsibility** for some satellite properties and facilities to other agencies, if it is beneficial to Open Space and Mountain Parks and the receiving agency.

- **Expand opportunities for local community groups** to participate in "Adopt-A-Trail," Trail Guides, and other hands-on stewardship projects.

- **Expand opportunities to partner with the community** for joint programs that implement the Visitor Master Plan such as educational programs, maintenance and restoration activities, trail projects, monitoring activities, and others.

- **Expand volunteer capabilities of Open Space and Mountain Parks** to organize and supervise more volunteer trail improvement projects.

- **Expand staff capabilities to apply for and obtain external funds for high-priority projects.** Increase the sharing of grant funding ideas, the number of grants applied for, and associated staff training for grant writing.

- **Expand staff capabilities to manage contracts**, including project planning and management.

- **Support a "Friends of Open Space and Mountain Parks" Foundation** to raise private donations**.**

- **Create financial stewardship opportunities** for neighborhoods, clubs, and businesses to contribute financially to specific trails or other facilities.

- **Maintain the Flagstaff Mountain parking fee system** and investigate making it more efficient in administration with increased compliance and associated revenues.

Project Phasing for Plan Implementation

Major capital and non-capital projects to implement the Visitor Master Plan are scheduled for the Open Space and Mountain Parks work plan. Projects listed below are among the major projects identified for 2005 through 2010 to achieve the goals in the Visitor Master Plan.

2005

Trail Study Areas

- Complete development of trail suitability and evaluation criteria (including undesignated trail evaluation criteria)
- Complete two Trail Study Area plans: Marshall Mesa-Southern Grasslands and Eldorado Mountain-Doudy Draw
    - Designate climbing accesses in Habitat Conservation Areas (Sacred Cliffs, Peanuts Wall, Mickey Mouse Wall)
    - Designate additional no-dog trails

Trail Planning

- Study Boulder Feeder Canal Trail
- Plan Greenbelt Plateau to Coalton Trail

Trail Construction

- **New Trails**
    - Fund building Cottontail Trail to connect to Monarch Trail (across State Highway 52)
    - Build Marshall Mesa to South 66th St. (community volunteer project)
    - Build Flagstaff Sensory Interpretive Trail
    - Build Marshall Mesa-City Limits Trail
- **Rebuild or Re-Route Trails**
    - Rebuild Elephant Buttress trail and restore area (volunteer project component)
    - Rebuild/reroute E.M. Greenman Trail
    - Rebuild/reroute Bear Canyon Trail--middle section

Trailhead Improvements

- Settlers Park Trailhead
- Crown Rock Trailhead
- Boulder Falls
- South Mesa Trailhead
- Build City Limits Trailhead
- Plan Sanitas Trailhead and Centennial Trailhead improvements

Road Crossings

- Construct Community Ditch underpass at State Highway 93
- Study South Boulder Creek Trail road crossing at State Highway 93

New Non-Capital Priority Projects

- Adopt new ordinances for on-trail travel and dogs on-leash in Habitat Conservation Areas, sign areas, and begin education and enforcement
- Adopt trailhead leash ordinance, sign areas, and begin education and enforcement
- Complete dog management compliance video and begin education, signs and training classes (with public participation)
- Develop commercial use permit program with public process
- Revise Special Use Permit ordinance

- Develop Habitat Conservation Area off-trail access permit program, including criteria (with public process)
- Focus public information and education focus--signs, maps, brochures, webpage
- Begin implementation and effectiveness monitoring--collect baseline data, when necessary
- Hold annual public forum to review work program

2006

Trail Study Areas
- Complete four Trail Study Areas (North Foothills, Tallgrass Prairie East, Mountain Parks North, and East Boulder-Dry Creek)
    - Designate climbing access using results from Trail Study Areas
    - Designate additional no-dog trails

Trail Planning
- Plan Boulder Feeder Canal Trail in conjunction with city and county
- Plan Saddle Rock Trail improvements
- Plan Chautauqua (Bluebell-Baird and Bluebell Mesa) trail rebuilds
- Plan Dry Creek-South Boulder Creek Trail

Trail Construction
- **New Trails**
    - Build Greenbelt Plateau-Coalton Trail
    - Build Wonderland Paraglider Access Trail
    - Implement 2005 Trail Study Areas improvements
- **Rebuild or Re-Route Trails**
    - Rebuild Marshall Mesa-Community Ditch Trail

Trailhead Improvements
- Improve Sanitas and Centennial Trailheads
- Improve Buckingham Park picnic area
- Improve Fourth of July campground

Road Crossings
- Improve South Boulder Creek Trail road crossing at State Highway 93
- Improve South Mesa to Doudy Draw road crossing at State Highway 170

New Non-Capital Priority Projects
- Require commercial use permits and off-trail permits
- Begin enforcement of new dog regulations
- Continue implementation and effectiveness monitoring
- Update maps and brochures
- Schedule two community volunteer projects
- Hold public forum to review work plan

2007

Trail Study Areas
- Complete three Trail Study Areas (Mountain Parks South, East Boulder-Teller, and Shanahan-South Mesa)

Trail Planning
- TBD

Trail Construction
- **New Trails**
  - Implement 2006 Trail Study Area improvements
  - Build Boulder Feeder Canal trail
  - Build Dry Creek-South Boulder Creek Trail
  - Designate climbing accesses
- **Rebuild or Re-Route Trails**
  - Rebuild/reroute Saddle Rock trail
  - Rebuild Chautauqua (Bluebell-Baird, Bluebell Mesa) trails

Trailhead Improvements
- Improve Gregory Canyon trailhead
- Improve Realization Point trailhead
- Plan Flagstaff Summit improvements

Road Crossings
- Improve road crossing on East Boulder Trail at Valmont Road

New Non-Capital Priority Projects
- TBD

2008

Trail Study Areas
- Complete two Trail Study Areas (others)

Trail Planning
- Plan Flagstaff Trail improvements
- Plan Dry Creek-Teller Trail (East Boulder Trail)

Trail Construction
- **New Trails**
  - Implement 2007 Trail Study Area improvements
  - Build North Rim Trail (Boulder County)
  - Build Dry Creek-Teller Trail (East Boulder Trail)--Phase 1
- **Rebuild or Re-Route Trails**
  - Chautauqua area trails

Trailhead Improvements
- Flagstaff Summit Trailhead

New Non-Capital Priority Projects
- TBD

2009

Trail Study Areas
- Complete two Trail Study Areas (Jewell Mountain and Union Pacific ROW)

Trail Planning

- Plan Bear Peak summit access from Fern Canyon and Bear Peak West Ridge
- Plan Green Mountain West Ridge Trail to Lost Gulch overlook
    - Plan upper Flagstaff Mountain trail connection

Trail Construction

- **New Trails**
    - Implement 2008 Trail Study Area improvements
    - Build Dry Creek to Teller (East Boulder Trail)
    - Continue Flagstaff Summit improvements
- **Rebuild or Re-Route Trails**
    - Flagstaff Trail

Trailhead Improvements

- Flagstaff Summit Trailhead

New Non-Capital Priority Projects

- TBD

2010

Trail Construction

- **New Trails**
    - Continue to implement Trail Study Area improvements
    - Green Mountain West Ridge Trail to Lost Gulch Overlook
- **Rebuild or Re-Route Trails**
    - Bear Peak summit access from Fern Canyon
    - Flagstaff Mountain trail connector

Visitor Master Plan References

Anderson M.G. 1999. Viability and spatial assessment of ecological communities in the northern Appalachian ecoregion. Ph.D. dissertation. University of New Hampshire.

Bekoff, M. and R.W. Ickes. 1999. Behavioral interactions and conflict among domestic dogs, black-tailed prairie dogs, and people in Boulder, Colorado. Anthrozoos **12:**105-110.

Boulder County. 1995. Boulder County comprehensive plan environmental resources element. Boulder County Land Use Department, Boulder, Colorado.

Boulder County. 1999. Boulder County comprehensive plan. Boulder County Land Use Department, Boulder, Colorado.

Boyle, S., and F. Samson. 1985. Effects of non-consumptive recreation on wildlife: a review. Wildlife Society Bulletin **13:**110.

Camp, R.J. and R.L. Knight 1998. Effects of rock climbing on cliff plant communities at Joshua Tree National Park, California. Conservation Biology **12(6):**1302-1306.

Causey, K. and C. Cude. 1978. Feral dog predation on the gopher tortoise*, Gopherus polyphemus*, in southeast Alabama. Herpetology Review **9:**94-95.

Chace, J.F., A. Cruz, and R.E. Marvil. 2000. Reproductive interactions between brown-headed cowbirds and plumbeous vireos in Colorado. Pages 128-134 in J.N.M. Smith, T.L. Cook, S.I. Rothstein, S.K. Robinson, and S.G. Sealy, editors. Ecology and management of cowbirds and their hosts. University of Texas Press, Austin.

Cialdini, R.B., R.R. Reno, and C.A. Kallgren. 1990. A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. Journal of Personality and Social Psychology **58:**1015-1026.

City of Boulder. 1993. Public opinion survey: dog management on open space. Unpublished report. City of Boulder Center for Policy and Program Analysis, Boulder, Colorado.

City of Boulder. 1994. 1994 open space use and management survey. Unpublished report. City of Boulder Center for Policy and Program Analysis, Boulder, Colorado.

City of Boulder. 1995. Open space long range management policies. City of Boulder Open Space Department, Boulder, Colorado.

City of Boulder. 1996. City of Boulder grassland management: black-tailed prairie dog habitat conservation plan. City of Boulder Open Space Department, Boulder, Colorado.

City of Boulder. 1997a. 1995/1996 mountain parks visitation estimate. Unpublished report. City of Boulder Center for Policy and Program Analysis, Boulder, Colorado.

City of Boulder. 1997b. The north Boulder Valley inventory report and area management plan. City of Boulder Open Space Department, Boulder, Colorado.

City of Boulder, 1998. The South Boulder Creek area management plan. City of Boulder Open Space Department, Boulder, Colorado.

City of Boulder. 1999a. Boulder citizen survey 1999. City of Boulder Center for Policy and Program Analysis, Boulder, Colorado.

City of Boulder. 1999b. Charting the vision: integration and balance in the Boulder mountain parks: Boulder mountain parks resource protection and visitor use plan. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

City of Boulder. 1999c. City of Boulder forest ecosystem management plan. City of Boulder Open Space Department; Boulder Mountain Parks Division, Parks and Recreation Department; Wildland Fire Division, Boulder Fire Department; Boulder, Colorado.

City of Boulder. 2000a. 2000 Mountain parks user survey. Unpublished report. City of Boulder Division of Audit and Evaluation, Boulder, Colorado.

City of Boulder. 2000b. Visitor plan advisory committee report. City of Boulder Open Space Department, Boulder, Colorado.

City of Boulder. 2001a. Boulder citizen survey 2001. City of Boulder Center for Policy and Program Analysis, Boulder, Colorado.

City of Boulder. 2001b. Boulder Valley comprehensive plan. City of Boulder Department of Community Design, Planning, and Development, Boulder, Colorado.

City of Boulder. 2001c. Inventory of open space lands, City of Boulder, Colorado 1999. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

City of Boulder. 2003a. Condition, compatibility, and trends. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado. Available at: http://www.visitorplan.com

City of Boulder. 2003b. Memorials and donations policy. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

City of Boulder. 2003c. Summary of activities assessment. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado. Available at: http://www.visitorplan.com

City of Boulder. 2003d. Visitor plan advisory committee report. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado. Available at: http://www.visitorplan.com

City of Boulder. 2004a. Open space and mountain parks regulations from the Boulder revised code. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

City of Boulder. 2004b. Report of the community group forum. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado. Available at: http://www.visitorplan.com

City of Boulder. 2004c. Subarea descriptions. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado. Available at: http://www.visitorplan.com

City of Boulder. 2004d. Trails assessment and prioritization report. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado. Available at: http://www.visitorplan.com

Collinge, S.K. and R.T.T. Forman. 1998. A conceptual model of land conversion processes: predictions and evidence from a microlandscape experiment with grassland insects. Oikos **82:**66-84.

Colorado Natural Heritage Program. 1999. Conservation status handbook. Volume 3. No. 2. Colorado State University, Fort Collins.

Colorado Natural Heritage Program. 2001. Colorado natural heritage program: the natural heritage methodology. Colorado State University, Fort Collins. Available at: http://www.cnhp.colostate.edu/docs/methodology.html (accessed May 31, 2002).

Cooper, D.J., editor. 1994. Ecological survey of the city of Boulder, Colorado mountain parks. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

Cordell, H.K. 1999. Outdoor recreation in American life: a national assessment of demand and supply trends. Sagamore Publishing Inc., Champaign, Illinois.

Cordell, H.K. 2002a. Outdoor recreation: segmenting Americans and markets to better see the trees. U.S. Department of Agriculture; Forest Service; Southern Research Station; Wilderness, Urban Forest, and Demographic Trends Research Group, Athens, Georgia. On-line presentation available at: http://www.srs.fs.usda.gov/trends/OIAAZ.ppt (accessed October 10, 2002).

Cordell, H.K. 2002b. Using demographic and population survey data to better align forest recreation management with public demand. U.S. Department of Agriculture; Forest Service; Southern Research Station; Wilderness, Urban Forest, and Demographic Trends Research Group, Athens, Georgia. On-line presentation available at: http://www.srs.fs.usda.gov/trends/clemson502.ppt (accessed October 10, 2002).

Denver Regional Council of Governments. 2000. Metro vision 2020: 2020 regional forecast summary. Denver, Colorado.

Denver Regional Council of Governments. 2003. Regional forecast by regional statistical area. Available at: http://www.drcog.org/reg_growth/reg_data/data/Forecast%20Summary.xls (accessed April 20, 2004).

Donnelly, M.P., J.J. Vaske, D. Whittaker, and B. Shelby. 2000. Toward an understanding of norm prevalence: a comparative analysis of 20 years of research. Environmental Management **25:**403-414.

Downham, T., S.J. Mertz, and D.S. Pollard. 2000. Boulder area accessible trails and natural sites. City of Boulder Open Space and Mountain Parks Department, Parks and Recreation Department EXPAND Program, Boulder County Parks and Open Space Department; Boulder, Colorado.

Essington, K.D., SM. Kettler, S.E. Simonson, C.A. Pague, J.S. Sanderson, P.M. Pineda, and A.R. Ellingson. 1996. Natural heritage resources of the Rocky Flat environmental technology site and their conservation. Colorado Natural Heritage Program; Fort Collins, Colorado.

Flatirons Climbing Council. 2000. Conserving the climbing resources and environment of Boulder's mountain parks: a climbing management proposal for the Flatiron Areas. Boulder, Colorado.

Fleischer-Mutel, C. and Emerick, J.C. 1992. From grassland to glacier: the natural history of Colorado and the surrounding region. Johnson Books, Boulder, Colorado.

Gershman, M.D. 2002. Relationship of dogs to visitor experience, ecological systems and agricultural operations: a summary of available information. Unpublished report. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

Graefe, A.R., F.R. Kuss, and J.J. Vaske. 1990. Visitor impact management. Volume 2. The planning framework. National Parks and Conservation Association, Washington, D.C.

Graham, R.E. 1966. Observations on the roosting habits of the big-eared bat, *Plecotus townsendii* in California limestone caves. Cave Notes **8:**17-22.

Grasmick, H.G., R.J. Bursik, Jr., and K.A. Kinsey. 1991. Shame and embarrassment as deterrents to noncompliance with the law: a case of an antilittering campaign. Environment and Behavior **23:**233-251.

Hammitt, W.E. and D.N. Cole. 1987. Wildland recreation: ecology and management. John Wiley and Sons, New York.

Heywood, J.L. 2000. The cognitive and emotional components of behavior norms in outdoor recreation. Unpublished paper. School of Natural Resources, Ohio State University, Columbus.

Hogan, T. 1993. A floristic survey of the Boulder mountain park, Boulder, Colorado. Natural History Inventory of Colorado No. 13. University of Colorado Museum, Boulder.

Hogan, T. 1994. A floristic inventory of the Doudy Draw / Eldorado Mountain Property. Unpublished report. City of Boulder Open Space Department. Boulder, Colorado.

Hogan, T. 1995. A report on the vegetation of the Flatirons area: Boulder mountain park, Boulder, Colorado. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

International Mountain Biking Association. 2002. Rules of the trail. Boulder, Colorado. Available at http://www.imba.com/about/trail_rules.html (accessed June 11, 2002).

Jones, M. and S. Armstead. 2002. Analysis of trails in fenced corridors and along roadways. Unpublished report. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

Jones, M. and B. Bruyere. 2004. Effectiveness of low impact education to reduce resource impacts. Paper presented at the Twelfth International Symposium for Society and Resource Management.

Jones, M. and R. Lowery. 2004. Effectiveness of education at cleaning up dog waste. Paper presented at the Twelfth International Symposium for Society and Resource Management.

Jones, S.R. 1989a. Boulder mountain park forest bird study. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

Jones, S.R. 1989b. Distribution of small forest owls in Boulder County, Colorado. Boulder County Nature Association, Boulder, Colorado.

Jones, S.R. 1990. Managing mountain park ecosystems for birds and mammals. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

Jones, S.R. 1993a. A preliminary survey of avian species of special concern on the city of Boulder's Doudy Draw and Eldorado Mountain properties. Unpublished report. City of Boulder Open Space Department, Boulder, Colorado.

Jones, S. R. 1993b. Habitat use by breeding birds at the National Center for Atmospheric Research. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

Jones, S. R. 1993c. Snag densities and breeding bird populations in Eldorado Mountain area ponderosa pine forest. Unpublished report. City of Boulder Open Space Department, Boulder, Colorado.

Jones, S. R. 1994. Distribution of owls on city of Boulder's Doudy Draw and Eldorado Mountain open space properties. Unpublished report. City of Boulder Open Space Department, Boulder, Colorado.

Jones, S. R. 1996. Cliff community bird and mammal populations in the Boulder mountain park. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

Joslin, G. and H. Youmans, coordinators. 1999. Effects of recreation on Rocky Mountain wildlife: a review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society.

Knight, R.L. and K.J. Gutzwiller, editors. 1995. Wildlife and recreationists: coexistence through management and research. Island Press, Washington D.C.

Kuss, F.R., A.R. Graefe, and J.J. Vaske. 1990. Visitor impact management. Volume 1. A review of research. National Parks and Conservation Association, Washington, D.C.

Manfredo, M.J., editor. 1992. Influencing human behavior: theory and applications in recreation, tourism, and natural resources management. Sagamore Publishing Inc., Champaign, Illinois.

Manfredo, M. J., editor. 2002. Wildlife viewing: a management handbook. Oregon State University Press, Corvallis.

Miller, J.E., and B.D. Leopold. 1992. Population influences: predators. Pages 119-128 in Dickson, J.G., editor. The wild turkey: biology and management. Stackpole Books, Harrisburg, Pennsylvania.

Miller, J.R., J.A. Wiens, and N.T. Hobbs. 2000. How does urbanization affect bird communities in riparian habitats? An approach and preliminary assessment. In J. Craig, N. Mitchell, and D. Saunders, editors. Nature conservation in production environments: managing the matrix. Surrey Beatty and Sons, Chipping Norton, New South Wales.

Miller, S.G, R.L. Knight and C.K. Miller. 1998. Influence of recreational trails on breeding bird communities. Ecological Applications **8(1):**162-169.

Moore, R.L. 1994. Conflicts on multiple-use trails: synthesis of the literature and state of the practice. Report No. PD-94-031. Intermodal Division, Federal Highway Administration.

National Park Service. 1991. Developing sustainable trail corridors: an overview. Mountain trail management: an outline. National Park Service Rocky Mountain Region, Denver, Colorado.

National Research Center, Inc. 2001. Boulder citizen survey: report of results. City of Boulder, Division of Audit and Evaluation, Boulder, Colorado. Note: Citizen surveys have been conducted every other year since 1987 with the exception of 1991. The survey reports are available in the Municipal Government Reference Center of the Boulder Public Library.

National Research Center, Inc. 2002. A study of attitudes of Boulder County, Colorado residents regarding public policy issues: summary report of results. Boulder County Board of Commissioners, Boulder, Colorado.

Neely, B., P. Comer, C. Moritz, M. Lammert, R. Rondeau, C. Pague, G. Bell, H. Copeland, J. Humke, S. Spackman, T. Schulz, D. Theobald, and L. Valutis. 2001. Southern Rocky Mountains: an ecoregional assessment and conservation blueprint. The Nature Conservancy with support from the U.S. Forest Service, Rocky Mountain Region, Colorado Division of Wildlife, and Bureau of Land Management.

Nelson, J.K.. 1998. Rare plant survey and floristic checklist of Lost Gulch, city of Boulder mountain parks, Boulder, Colorado. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

Office of Technology Assessment. 1993. Harmful non-indigenous species in the United States. OTA-F-565. U.S. Congress. U.S. Government Printing Office, Washington D.C.

Porter, R.D., C.M. White, and R.J. Erwin. 1973. The peregrine falcon in Utah, emphasizing ecology and competition with the prairie falcon. Bulletin of Biological Science **18:**1-74. Brigham Young University, Salt Lake City, Utah.

Postovit, H.R., and B.C. Postovit. 1987. Impacts and mitigation techniques. Pages 183-213 in B.A. Giron Pendleton, B.A. Milsap, K.W. Cline, and D.M. Bird, editors. National Wildlife Federation, Raptor management techniques manual. Scientific Technical Series 10. Washington, D.C.

Potito, A. 2000. Impacts of recreation trails on exotic invasive species distribution in grassland areas along the Colorado Front Range. Masters thesis. University of Colorado, Boulder.

Public Information Corporation. 1997. A study of attitudes of voting age residents of Boulder County, Colorado. Vol. I. Analysis. Unpublished report. Boulder County Board of Commissioners, Boulder, Colorado.

Public Information Corporation. 1998. A study of attitudes of Boulder County, Colorado residents regarding public policy issues. Vol. I. Analysis. Unpublished report. Boulder County Board of Commissioners, Boulder, Colorado.

Public Information Corporation. 1999. A study of attitudes of Boulder, Colorado residents regarding city open space issues. Vol. I. Analysis. Unpublished report. Boulder County Board of Commissioners, Boulder, Colorado.

Roggenbuck, J.W. 1992. Use of persuasion to reduce resource impacts and visitor conflict. Pages 149-208 in M.J. Manfredo, editor. Influencing human behavior: theory and applications in recreation, tourism, and natural resources management. Sagamore Publishing Inc., Champaign, Illinois.

Rondeau, R. 2001. Ecological system viability specifications for southern Rocky Mountain ecoregion. 1st Edition. Colorado Natural Heritage Program. Colorado State University, Fort Collins, Colorado.

Salzer, D. 2002. Monitoring to measure success. Unpublished report. The Nature Conservancy.

Sime, C. 1999. Domestic dogs in wildlife habitats: effects on recreation on Rocky Mountain wildlife. In G. Joslin and H. Youmans, coordinators. Effects of recreation on Rocky Mountain wildlife: a review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society.

Skowronski, B. 2002. Unpublished map. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

Soil Conservation Service. 1975. Soil survey of Boulder County area, Colorado. U.S. Department of Agriculture and Colorado Agricultural Experiment Station.

State of Colorado. 2004. Preliminary population projections for Colorado's counties (2000-2025). Colorado Department of Local Affairs, Demography section. Prepared August 26, 2002. Available from: http://dola.colorado.gov/demog/Population/PopulationTotals/Forecasts/Counties5.xls (accessed February 1, 2005).

Talmey-Drake Research and Strategy Inc. 1999. Boulder County issues survey (County Commissioners). Unpublished report. Boulder County Board of Commissioners, Boulder, Colorado.

Taylor, J. and R. Ickes. 1998. Disturbance effects on the behavior of black-tailed prairie dogs (Cynomys ludovicianus) at Dry Creek, Colorado. Unpublished class report. Department of Environmental, Population, and Organismic Biology, University of Colorado, Boulder, Colorado.

The Nature Conservancy. 2000. Draft ecological integrity assessment: a framework for conservation planning and measuring success. Ecological Systems Viability Workgroup.

U.S. Fish and Wildlife Service. 1990. Gopher tortoise recovery plan. Jackson, Mississippi.

U.S. Fish and Wildlife Service. 1999. South Florida multi-species recovery plan. Atlanta, Georgia.

U.S. Forest Service. 1999. Ozark-Ouachita highlands assessment. General Technical Report SRS-35. Southern Research Station, Asheville, North Carolina.

Wheeler, C.B. 1995. Visitation study for area management units. Unpublished report. City of Boulder Open Space Department, Boulder, Colorado.

Zeller, M., H.C. Zinn and M.J. Manfredo. 1993. Boulder open space visitation study. Unpublished report. City of Boulder Open Space Department, Boulder, Colorado.

List of Plan Reference Documents Available on the Open Space and Mountain Parks Website

The Plan Reference Documents are available on the Open Space and Mountain Parks website at www.osmp.org.

Condition, Compatibility, and Trends Analysis

Trail Assessment and Prioritization Report

Passive Recreation Activity Assessment Process

Synthesis of the Open Space and Mountain Parks Activity Assessment

Commercial Use Permits--A Draft Framework

Special Use Permits--A Draft Framework

2004 Open Space and Mountain Parks Citizen Survey

Boulder Mountain Parks Resource Protection and Visitor Use Plan, 1999

Summary of Public Comments on the Visitor Master Plan

Community Advisory Reports
- Visitor Plan Advisory Committee-1 Final Report, 2000
- Visitor Plan Advisory Committee-2 Final Report, 2003
- Report of the Community Group Forum, 2004

Appendices

Appendix 1.1: Summary of Visitor Use Studies

Visitation Studies and Trends **(entrance/exit studies)**

1993 Open Space Visitor Use Study

Estimates derived from an extensive visitor use study (Zeller et al. 1993) indicate that approximately 1,455,418 visits occurred on city of Boulder Open Space lands from June 1, 1992 to May 31, 1993. Visitation trend data, collected through 1999 using trail and vehicle counters, show a range of approximately 1.6 million to 1.9 million annual visits with an average of approximately 1.7 million annual visits on city of Boulder Open Space lands.

The majority of these visits occur during the spring (38%), followed by fall (28%), summer (24%), and winter (10%). The average party size is 1.4 persons with 70% of these visits being single visits. Ninety percent of all parties consisted of one or two persons. The average length of visits was 53 minutes.

The Open Space and Mountain Parks system is a regional system which gets substantial visitation from areas outside the city and county. While almost 75% of the visitation on Open Space in 1993 was by Boulder residents, a relatively high amount (10%) of the visits were from outside both the city of Boulder and Boulder County. Boulder County residents make up about 15% of the visits to Open Space. The origin of visits varies greatly by location within the Open Space system and time of year. Mountain Parks also received significant out-of-Boulder visitation.

1995/1996 Mountain Parks Visitation Estimate

It was estimated that annual visitation was 1.46 million visits (City of Boulder 1997a).

1995 North Boulder Valley Management Area Visitation Study

A visitor use study (Wheeler 1995) was conducted during the fall of 1995 to provide specific information on visitor use and distribution of visitation within the North Boulder Valley Management Area. The purpose of this study was to provide information on the relative amount of visitation and the types of activities that occur on various trails and regions of the management area. It also provided information on the time-of-day and day-of-the-week use occurs, information about off-trail activities, and trends in dog use (on-leash, off-leash, and distance from trail/owner.

A total of 15,436 visits were observed during 84 hours of sampling. Only 2.4% of all use observed within the management area occurred away from designated trails or on undesignated trails. Of those visits observed off designated trails or on undesignated trails, 21% were within 0 to 25 meters, 28% were within 25 to 100 meters, and the remaining 51% were further than 100 meters off designated trails or undesignated trails. Approximately 70% of the dogs observed were within 0 to 25 meters from the owner and approximately 86% were within 0 to 25 meters from the trail. Only 21% of the dog owners complied with the posted regulations in that portion of Zone A where dogs are required to be on a hand-held leash and the remaining 79% let their dogs off-leash.

2000 Mountain Parks User Survey

Mountain Parks conducted a user survey in 2000 (City of Boulder 2000a). Many of the questions from the 2000 Mountain Parks User Survey were also used in a similar 1995/1996 study. The

average party size was 2.1 people. On average, people visited 28 times per year. Eighty percent of all parties consisted of one or two persons.

Two-thirds of Mountain Parks visits were from Boulder residents, 6% from unincorporated Boulder County, 12% from other cities in Boulder County, 10% from metro Denver, 4% from other areas in Colorado, and 10% from out of state; visitors from other Boulder County cities jumped 8% from 1995 to 2000.

Large changes in activity participation from 1995 to 2001 were: hiking 53% to 71%, scenic viewing 7% to 13%, photography 2% to 9%, exercising pets 11% to 19%, and climbing 4% to 7%. Parties accompanied by one or more dogs rose from 13% to 25%. Eighty-eight percent (88%) of visitors thought the balance between preservation and recreation was just about right, with 8% saying there was too much emphasis on recreational opportunities, and 4% saying there was to much emphasis on the natural environment.

Related Open Space and Mountain Parks Studies

1999 Open Space Visitor Plan Phone Survey

Purposes of Open Space

Boulder residents thought the single primary purpose of Open Space was managing growth/buffer (39%) with environmental preservation and providing recreation both receiving 23%. These priorities have not changed substantially from two previous polls (1992 and 1994).

Balancing Passive Recreation and Environmental Preservation

Nearly two-thirds (62%) felt the current balance is “about right.” Of those who felt the balance was wrong, twice as many people (20%) felt there was too much emphasis on recreation (not enough on environmental preservation) than felt (11%) there was too much emphasis on preservation (not enough on recreation).

In a related question, 93% of the respondents indicated it is important to consider the negative impact of recreation on the natural environment when making management decisions (62% “very important”, 31% “somewhat important”). When recreation and preservation efforts conflict, the following management options are the four most preferred: education of users, temporary closures, limiting use to designated trails, and limiting activities that cause greatest impact.

Definition of “Passive Recreation”

In an open-ended question, the most common response contained one or more of the following four concepts: (1) the importance of having and maintaining high natural aesthetic qualities as part of the recreational experience and when Open Space is viewed from a distance, (2) the desire that recreational activities cause, at most, only minor harm to the natural environment and wildlife habitats, (3) the provision of low intensity recreational activities that are relaxing, calming, quiet, and leisurely, and (4) the absence of motorized and organized/structured sports-like activities.

Current Passive Recreational Uses

By far, the main passive recreational use respondents engage in is hiking (67%). Other significant uses include biking (22%), jogging (11%), and dog walking (10%). Several minor uses were indicated; however only fishing (3%) and picnicking (3%) are engaged in by more than 1% of the respondents. Only 8% of the respondents indicated they did not use Open Space or used it rarely. Clearly, a very large portion of the local population visits Open Space and two-thirds visit it for hiking.

One important question asked respondents to rate the appropriateness of five criteria for determining which recreational activities were appropriate for Open Space. Interviewees indicated that all five are highly appropriate for this purpose. The five listed in order (beginning with the most appropriate) are: the potential for negatively impacting the environment, the potential for positively increasing the user's appreciation of nature, the potential for negative impacts to aesthetic values, the benefit the activity has to the community, and the potential for increasing user conflicts.

Passive Recreational Quality

An overwhelming 93% of the respondents indicated the quality of their passive recreational experiences on Open Space is "excellent" (58%) or "good" (35%).

Problems experienced by passive recreational users appeared in two questions on the survey. The results of one question indicated that the most significant problem is conflicts with certain other types of uses, particularly with bicycles (27% saw this as problematic) and dogs (26% - due to feces and dogs out of control). In another question, trail crowding was seen as a problem by 16% of passive recreational users (15% chose "crowded", 1% "extremely crowded").

The four most popular management options for dealing with passive recreational conflicts and crowding according to the respondents are buying more land, educating users, enforcing laws, and limiting problem activities.

Passive Recreational Facilities and Services

Eighty-nine percent (89%) of respondents felt Open Space facilities are "excellent" (39%) or "good" (50%). Many suggestions were made for improvements, but all registered a smaller response (5% to 12%). The suggestions dealt with trail construction and maintenance, signs, trash, parking, restrooms, and enforcement of leash laws.

Nearly two-thirds of respondents felt visitor services are "excellent" (20%) or "good" (45%). Twenty-one percent (21%) had no response. Only two suggested improvements garnered more than a 2% response. They are "more public information" (20%) and "more law enforcement" (11%). More than half of the respondents made no suggestions at all.

1999 Leave-No-Trace Observational Study

A trailhead observational study was performed to identify which Leave-No -Trace principles were not being followed and to more effectively focus Leave-No-Trace education on problem behavior. Observations were only performed at trailheads and not for entire visits. Of those observed,13% of visitors did not follow at least one principle. Of those, 68% did not manage their dog, 12% did not pick up their dog's poop, 12% went off-trail, 4% littered, 3% took something, and 1% did not share the trail.

1999 Leave-No-Trace Trailhead/Mailer Survey

A pre/post study was conducted in 1999 of city of Boulder Open Space visitors to determine if their knowledge and behavior changed following a "front country" Leave-No-Trace educational effort. Respondents were asked Leave-No-Trace knowledge and behavior questions at trailheads. Visitors were then contacted at the same trailheads to educate them about Leave-No-Trace principles. A brochure was handed out to reinforce the contact. Signs were placed. Respondents were surveyed later to again measure their Leave-No-Trace knowledge and behaviors. Surveys were also analyzed to determine which type of communication appears to be a more compelling approach. Additionally, results were compared by user group, age, frequency of visits to open space, gender, and years living in the county.

Results indicate that Leave-No-Trace knowledge did increase, albeit minimally and only differed significantly by gender. Overall, Leave–No-Trace knowledge was considerably high before the

treatment. Also, familiarity with regulations was more predictive of whether an individual actually practiced Leave-No-Trace behaviors than was one's Leave-No-Trace knowledge or time spent thinking about specific Leave-No-Trace behaviors. This indicates that Leave-No-Trace educational efforts may not be as effective as other strategies, such as enforcement, in changing behavior when the user group is already highly knowledgeable of Leave-No-Trace principles.

1999 Behavioral Interaction and Conflict among Domestic Dogs, Black Tailed Prairie Dogs, and People in Boulder, Colorado

Sixty percent of dogs near the Dry Creek Trailhead were observed to either bark at, run towards, chase, or attempt to catch prairie dogs (Bekoff and Ickes 1999). Only 25% of the time did the guardian try to stop dogs from harassing prairie dogs. Most dogs (68%) traveled more than 5 meters off the trail. In a written survey, 16% reported their dog did occasionally disturb prairie dogs; of these, 50% said they tried to stop their dogs from disturbing prairie dogs. Fifty-eight percent said prairie dogs should not be protected even if dogs were a problem.

2001 Boulder Resident Mail Survey

Protecting habitat for wildlife and plants and preserving scenic views were indicated by residents of Boulder in a 1999 survey as the clear priorities for managing Open Space and Mountain Parks lands. When asked about the relative importance of some management items, Boulder residents rated protecting habitat for wildlife and plants and preserving scenic views 97% and 96% respectively as either very or fairly important. Growth management, preserving agriculture, and hiking ranked more than 80%. When asked to rank the number one management priority of the items, 41% chose protecting habitat, 23% chose preserving scenic views, and 19% chose growth management. The highest ranking recreation activity was hiking at 5%.

2001 Ranger Reports

In 2001, 207 summonses were issued by rangers. Of these 104 were for dog violations: 59 dog at-large (23 not under voice-and-sight control, 33 off-leash in a leash area, three not with keeper), 25 dogs in prohibited areas, 11 failure to protect wildlife, seven aggressive dog, one improper animal care, and one dog poop left. Illegal camping resulted in 67 summonses. Others summonses included: entering wildlife closure (11), trespassing on public property (four), damaging public property, consumption of alcohol, (three), illegal fire, possessing glass bottle, illegal boating, littering, possession of alcohol (two), and driving vehicle off roadway, discharge fireworks, possession of fire arm (one).

In 2002, 233 summonses were issued. Of these 129 were dog violations: 98 dog at-large (38 not under voice-and-sight control, 60 off-leash in a leash area), 22 dogs in prohibited areas, four dog poop left, three failure to protect wildlife, and two aggressive dog. Illegal camping resulted in 79 summonses. Others summonses included: mountain biking where prohibited (seven), entering wildlife closure (four), entering Boulder Falls closure, entering closed property (three), fishing where prohibited (two), possession of firework (landing a hot air balloon--fire hazard), discharged firearm, possessing glass bottle, consumption of alcohol, picking flowers prohibited, and emergency policy--no smoking (one).

2004 Open Space and Mountain Parks Visitor Master Plan Phone Survey

<u>Purposes and management priorities of Open Space</u>

Boulder residents thought the most important purpose of Open Space and Mountain Parks was: providing recreation (31%), environmental preservation (24%), managing growth/buffer (18%), and aesthetics (15%). Controlling growth dropped 21% since a 1999 survey and providing recreation gained 8%, while environmental protection stayed about the same.

When asked the question "What is the most important management priority?", 45% stated environmental protection, 19% mentioned some sort of recreation, 11% said community buffers, and 9% replied preserving scenic views.

Balancing Passive Recreation and Environmental Preservation

Two-thirds (68%) said the current management balance is "about right." Of those who felt the balance was wrong, about the same number said they felt there was too much emphasis on recreation (not enough on environmental preservation) (15%) than felt there was too much emphasis on preservation (not enough on recreation) (12%).

When recreation and preservation efforts conflict, or when there is conflict among users, the following management options were considered very or somewhat appropriate: have city ecologists determine Open Space and Mountain Parks habitat value (96%), limit use to designated trails in high wildlife value areas (94%), leash dogs in high wildlife value areas (91%), leash dogs for first 100 yards from trailhead (86%), no dogs in high wildlife value areas (81%), and required permits for visitors to go off trails in high wildlife areas (77%). Charging a fee to people out of the city was only considered very or somewhat appropriate by 32%, and charging a fee to people out of the county by 50%.

Current Passive Recreational Uses

The primary passive recreational use interviewees engage in is hiking (83%). Other significant uses include biking (30%), enjoying beauty (12%), dog walking (11%), and jogging (10%). Several minor uses were indicated; however, only picnicking (5%), climbing (5%), and winter sports (4%) are engaged in by more than 1% of the respondents. Only 1% of the interviewees indicated they did not use Open Space or used it rarely. Clearly, a very large portion of the local population visits Open Space and four-fifths visit it for hiking.

Passive Recreational Quality

Ninety-six percent of the interviewees indicated the quality of their passive recreational experiences on Open Space is "excellent" (60%) or "good" (36%).

Problems experienced by passive recreational users appeared in two questions on the survey. When asked what activities are in conflict, bike-related answers were 37% and dog-related comments at 23%. About 10% said they were not aware of conflicts. When asked what activities could make a person's experience much, or somewhat more pleasant, more that 60% of the respondents indicated hikers, dogs on-leash, and runners made their experience more pleasant; horse back riders were 45%, and mountain bikers and dogs off-leash were 34% and 32% respectively.

The four most popular management options for dealing with passive recreational conflicts and crowding according to the interviewees are buying more land, educating users, enforcing laws, and limiting problem activities.

Passive Recreational Facilities & Services

Ninety percent (90%) of interviewees felt Open Space facilities are "excellent" (40%) or "good" (50%). Many suggestions were made for improvements--better dog management (19%), trails/trails maintenance (17%). Better signs, acquire more open space, more parking, more rangers and more/better maintained toilets all were under 10%. Most (87%) found signs warning of hazards to be adequate, about half (55%) found enforcement of bike regulations, and a third found enforcement of dog voice-and-sight (37%) and enforcement of excrement pick up (33%) to be adequate.

2004 FIDOS/Open Space and Mountain Parks Effectiveness of Trailhead Education on Cleaning Up Dog Excrement Study

A partnership was formed in 2003 between Open Space and Mountain Parks and Friends Interested in Dogs and Open Space (FIDOS), a local advocacy group, to assess the effectiveness of education at reducing dog excrement. The study consisted of counting and mapping with a GPS unit the dog deposits before, during, immediately after and several months after the education treatment along one trail adjacent to a trailhead. FIDOS members promoted the "1 + 1, pick up an extra" program at the trailhead for 40 hours over a 3 week period. Brochures were distributed and signs posted to support the personal contact. Dog litter levels were significantly reduced during (63%), immediately after (68%) and six months (81%) after the educational treatment.

2004 Open Space and Mountain Parks/Colorado State University Effectiveness of Low Impact Education to Reduce Resource Impacts

A pre/post study was conducted of Open Space and Mountain Parks visitors to determine if their knowledge and behavior changed following a 1999 "front country" Leave-No-Trace educational effort. Respondents were asked Leave-No-Trace knowledge and behavior questions at trailheads. Visitors were then contacted at the same trailheads to educate them about Leave-No-Trace principles. A brochure was handed out to reinforce the contact. Signs were placed. Respondents were surveyed later to again measure their Leave-No-Trace knowledge and behaviors. Surveys were also analyzed to determine whether or not different communication approaches appear to be more compelling. Additionally, results were compared by user group, age, frequency of visits to open space, gender, and years living in the county. Results indicate that Leave-No-Trace knowledge did increase minimally, and only differed significantly by gender (women were more knowledgeable of Leave-No-Trace). Overall, Leave-No-Trace knowledge was considerably high before the treatment. Also, familiarity with regulations was more predictive of whether an individual actually practiced Leave-No-Trace behaviors than was one's Leave-No-Trace knowledge or time spent thinking about specific Leave-No-Trace behaviors. This indicates that Leave-No-Trace educational efforts may not be as effective as other strategies in changing behavior when visitors are already highly knowledgeable of Leave-No-Trace principles. More effective strategies likely include raising awareness of consequences of non-compliance, social desirability of compliance, and approaches that trigger individual reaction.

Regional Trends

1997 Boulder County Open Space Survey

Results about management priorities and acceptability of management options from this survey parallel the results from the 1999 City of Boulder Open Space Visitor Plan Survey. Protecting habitat for wildlife was the most important value with 75% saying it was very important to them, and 21% saying it was fairly important. Hiking was next highest, with 64% saying it was very important, and 29% saying it was fairly important.

Support for direct management options was strong. Requiring visitors to stay on-trail in sensitive areas was thought to be very or fairly important by 94%, seasonal trail closures to protect wildlife was at 92%, closing trails in sensitive areas to dogs was 84%, closing selected trails to some visitors to minimize conflicts with hikers 84%.

2002 Boulder County Open Space Survey

Results about management priorities and acceptability of management options from this survey parallel the results from the 2001 Boulder Citizen Mail Survey, the 1999 Visitor Plan Survey, and the 1997 Boulder County Open Space Survey. Following are the results of the survey, with the survey break-out for Boulder residents included in the percentage following the County results.

Once again, protecting habitat for wildlife was the most important value with 71% (77%). Preserving agriculture lands was next with 59% (58%) saying it was very important to them and 30% (33%) saying it was fairly important. The highest passive recreation activity was hiking, with 57% (66%) saying it was very important and 34% (29%) saying it was fairly important.

Requiring visitors to stay on-trail in sensitive areas was thought to be very or fairly important by 94%. Creating preservation areas in certain sensitive wildlife areas at 91%, and creating plans before opening properties at 67%, were supported in the survey.

National Trends

Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends

Nationally, hiking, horseback riding, and climbing days are all projected to increase by at least 50% from 1995 to 2050. In 1995 about 48 million people participated in hiking, 14 million rode horses, and 7.5 million rock climbed. Information for other activities were not available or were compiled in a way that did not apply to Open Space and Mountain Parks (Cordell 1999).

Appendix 1.2: Guidance from Other Plans

Guidance for developing a Visitor Master Plan on city of Boulder Open Space and Mountain Parks lands is provided at two levels. First, numerous planning documents exist within the Open Space and Mountain Parks Department. These documents are described below and include the City of Boulder Charter, *Long Range Management Policies* (City of Boulder 1995), resource management plans, and area management plans.

The second level of plan guidance is provided at a regional level. Regional plan guidance is provided by the *Boulder Valley Comprehensive Plan* (City of Boulder 2001b) and the *Boulder County Comprehensive Plan* (Boulder County 1999).

City of Boulder Charter

The management of Open Space and Mountain Parks lands is guided by the City Charter, as approved by the city of Boulder voters in 1986.

Sec. 176. Open Space Purposes - Open space land.

Open space land shall be acquired, maintained, preserved, retained, and used only for the following purposes:

- *Preservation or restoration of natural areas characterized by or including terrain, geologic formations, flora, or fauna that is unusual, spectacular, historically important, scientifically valuable, or unique, or that represent outstanding or rare examples of native species;*
- *Preservation of water resources in their natural or traditional state, scenic areas or vistas, wildlife habitats, or fragile ecosystems;*
- *Preservation of land for passive recreation use, such as hiking, photography or nature study, and if specifically designated, bicycling, horseback riding, or fishing;*
- *Preservation of agricultural uses and land suitable for agricultural production;*
- *Utilization of land for shaping the development of the city, limiting urban sprawl and disciplining growth;*
- *Utilization of non-urban land for spatial definition of urban areas;*
- *Utilization of land to prevent encroachment on floodplains; and*
- *Preservation of land for its aesthetic or passive recreational value and its contribution to the quality of life of the community.*

Mission

The Open Space and Mountain Parks Department preserves and protects the natural environment and land resources that characterize Boulder. We foster appreciation and use that sustain the natural values of the land for current and future generations.

Long Range Management Policies

The city of Boulder Open Space and Mountain Parks Department *Long Range Management Policies* were adopted in 1995. This document sets the framework and provides direction for Open Space and Mountain Parks planning processes and subsequent management decisions. The *Long Range Management Policies* state "Open Space and Mountain Parks will be managed in a way that provides for aesthetic enjoyment, minimizes cumulative impacts to the natural ecosystems and conflicts between users, considers user safety, preserves responsible agricultural use, provides for a quality recreational experience, and protects natural areas." While many aspects of the *Long Range Management Policies* affect visitor use, sections IX and X specifically address use of Open Space and Mountain Parks and Open Space and Mountain Parks facilities.

IX. Use of Open Space

This section describes the potential uses of Open Space and Mountain Parks and provides recommendations concerning management of visitor use, accessibility for disabled persons, special uses, and visitor safety.

X. Open Space and Mountain Parks Facilities

This section describes the potential types of Open Space and Mountain Parks facilities and provides recommendations on access, trail systems, and related facilities.

Resource Management Plans

Resource plans provide system-wide management guidance for various natural, cultural, or agricultural resources and are integrated into specific on-the-ground actions contained within area management plans.

City of Boulder Grassland Management Black-Tailed Prairie Dog Habitat Conservation Plan

The *City of Boulder Grassland Management Black-Tailed Prairie Dog Habitat Conservation Plan* (City of Boulder 1996) was approved in 1996. This plan provides guidance on the management of grasslands to protect, preserve, and enhance habitat suitable for black-tailed prairie dogs. While many aspects of the grassland plan affect visitor use, sections 8.8.1 through 8.8.3 specifically address plague, trails, and pets.

8.8.1 Response to Plague

This section describes the public health concerns associated with bubonic plague and recommends that prairie dog preserves generally not be located where there is potential for prairie dogs to come in contact with large numbers of people. This section also provides recommendations for monitoring signs of plague and actions which may be necessary to protect the public from exposure to plague.

8.8.2 Trails

This section describes the importance of trails to focus visitor use and provide opportunities for the public to access and observe prairie dog colonies. To keep the degree of disturbance to a minimum, trails should be located along the margins of prairie dog colonies and visitors should be encouraged to stay on trails near prairie dog colonies.

8.8.2 Pets

This section describes the impacts which can occur when pets and prairie dogs interact and recommends pets may be restricted to designated trails, required to be on a hand held leash, or restricted in grassland preserves.

Forest Ecosystem Management Plan

The *Forest Ecosystem Management Plan* (City of Boulder 1999c) was completed in 1999 and provides specific management direction to ensure the ecological sustainability of Boulder's forests. The *Forest Ecosystem Management Plan* will adhere to the principles of ecosystem management, while working to achieve the primary goals of conserving and promoting biological diversity and reducing the risk of wildfire to forest and human communities.

Area Management Plans

Area management planning provides on-the-ground management and direction. Two area management plans have been completed, North Boulder Valley Area (City of Boulder 1997b) and South Boulder Creek (City of Boulder 1998). These plans define and provide goals for passive recreation. The following definitions, goals, and objectives have been developed to guide management of passive recreation resources under area management plans.

Definitions

Recreation is often defined as activities that offer a contrast to work-related activities and that offer the possibility of constructive, restorative, and pleasurable benefits. Passive recreation is generally considered to be activities that occur in a natural setting which require minimal developments or facilities and for which the importance of the environment or setting for the activities is greater than in developed or active recreation situations.

Goals

- Manage and preserve natural and cultural resources
- Manage and preserve land for passive recreation use, its aesthetic or passive recreational value, and its contribution to the quality of life of the community
- Maintain sustainable agricultural operations by balancing economic and natural resource considerations

Objectives

- Provide a variety of appropriate quality passive recreation activities, outdoor education opportunities, and visitor services where compatible with protection of resources
- Preserve scenic vistas and undeveloped views
- Provide trails, access points, and passive recreational facilities to accommodate appropriate uses and to connect with adjacent trail systems
- Provide safe passive recreation experiences
- Minimize passive recreation impacts to natural, cultural, and agricultural resources

Boulder Mountain Parks Resource Protection and Visitor Use Plan

The *Mountain Parks Resource Protection and Visitor Use Plan* (City of Boulder 1999b) provides management direction for Mountain Parks lands. Guiding Principles were used to direct both short- and long-term management decisions, balance competing goals, and define strategies:

- Integrate the activities of nature and people

- Maintain Boulder Mountain Parks as a place of inspiration, natural wonders, spiritual renewal, and educational benefit for the community
- Where there are real or potential conflicts between nature and human use in the Boulder Mountain Parks, preference will be given to sustaining nature - both for its intrinsic values and its value as a component of human experience
- Managing the Mountain Parks is a shared responsibility. We seek to inform and engage the community in the challenges of setting policy and managing the park. (City of Boulder 1999b)

Management objectives included:

- Promote long-term sustainability of resources
- Utilize an adaptive natural resource management program
- Work with neighbors to maintain natural functions
- Utilize a system of management areas
- Manage recreation to protect natural resources and enhance visitor experience
- Improve interpretive, educational and research opportunities and engage the community in a cooperative stewardship program
- Improve the safety of Boulder Mountain Parks
- Improve core park management and maintenance
- Enhance park funding and staffing

The plan uses a "management zone" framework to provide management guidance and for implementing management actions.

Boulder Valley Comprehensive Plan

The *Boulder Valley Comprehensive Plan* contributes to the Open Space and Mountain Parks mission and states that the environment of the Boulder Valley is a critical asset that must be preserved and protected, and provides the framework within which growth and development may be permitted to take place.

The *Boulder Valley Comprehensive Plan* establishes the coordination between the city of Boulder and Boulder County on planning issues involving both agencies. The Boulder Valley is a Community Service Area within Boulder County where the city and county have agreed upon a set of land use and management policies to implement joint planning objectives. This level of interagency commitment to a shared vision is unique and has proven to be beneficial to both agencies.

The current *Boulder Valley Comprehensive Plan*, adopted by both the city and the county in 1977, and updated periodically, describes the city's Open Space Plan as providing "the basic structure of the Boulder Valley Comprehensive Plan" (City of Boulder 2001b). The *Boulder Valley Comprehensive Plan* includes the purposes and functions of Open Space and Mountain Parks as defined by the Open Space Board of Trustees. Other community, environmental and design policies set goals for protecting many features of the Boulder Valley, including the appearance of major entryways, agricultural areas, critical habitat areas, and aquifer and groundwater recharge areas. Facilities policies promote cooperation to provide a trails network when compatible with environmental preservation goals. Many of the policies and maps in the *Boulder County Comprehensive Plan*, dealing with the protection and management of significant agricultural lands, wildlife and plant habitats, natural landmarks and natural areas, archaeologically sensitive areas, and provision of trails, are now components of the *Boulder Valley Comprehensive Plan*. The 1996 update of the *Boulder Valley Comprehensive Plan* added a Natural Ecosystem Map and related policies.

The 1996 update of the *Boulder Valley Comprehensive Plan* identified general policy direction for resource and land protection and management. Restoring, maintaining, and sustaining the environmental quality of the Boulder Valley are principal emphases of the revised *Boulder Valley Comprehensive Plan*. Protecting and restoring native ecosystems, biological diversity, and natural processes are essential elements of these policies. Preservation of agricultural lands, wetlands, Open Space and Mountain Parks, and historic and cultural resources are other major components of the environmental sections of the *Boulder Valley Comprehensive Plan*. The Boulder Valley Comprehensive Plan Trails Map is a guide for existing and proposed trails and trail connections for the Boulder Valley.

The Boulder Valley Natural Ecosystems Map, designating significant, high quality native ecosystems or restorable native ecosystems in the Boulder Valley, is a component of the *Boulder Valley Comprehensive Plan* land use map. Boulder Valley natural ecosystems are defined as places that support native plants and animals or possess important ecological, biological, or geological values. Boulder Valley natural ecosystems may also contain features that are rare, unique, or sensitive to human disturbance and are essential to maintain the scientific and educational importance of places representing the rich natural history of the Boulder Valley. The Natural Ecosystems Map also identifies connections and buffers that are important for sustaining biological diversity and viable habitats for native species, protecting the ecological health of certain natural systems, and buffering potential impacts from adjacent land uses.

The purpose of the Boulder Valley Natural Ecosystems Map is to guide city and county planning decisions in the protection of wildlife and plant habitats. Natural ecosystem designations will not necessarily preclude development or human use of a particular area, but will serve to educate agencies and landowners about environmental concerns in particular areas. Information contained in the Natural Ecosystems Map may be used in planning decisions for service area changes, land use designation changes, annexations and zonings, development reviews, Valley-wide planning, subcommunity and departmental master planning, land acquisitions, and private land management.

Boulder County Comprehensive Plan

County comprehensive plans are mandated by state law and address county land use. City of Boulder Open Space and Mountain Parks lands, for the most part, are under the land use jurisdiction of Boulder County. Boulder County adopted one of the earliest and most comprehensive county land use plans in Colorado. The *Boulder County Comprehensive Plan* (Boulder County 1999) is revised every five years and is adopted by the Boulder County Planning Commission. The plan has four principal elements: land use, parks and open space, environmental resources (including Environmental Conservation Areas), and cultural resources. The plan is also a guide for development in the County's rural areas, outside municipal planning boundaries. Revisions are prepared with the cooperation of municipalities, but are not subject to their approval.

Several major goals and policies in the *Boulder County Comprehensive Plan* are relevant to Open Space and Mountain Parks planning. Public use of Open Space and Mountain Parks should be consistent with the purposes of the acquisition of the land and resource management plans. Preservation and conservation of agricultural lands is a primary goal for Boulder County as is maintenance of the rural character of the County. Trails policies include planning trails to avoid degradation of natural and cultural areas, coordination among government agencies on a county-wide trail system, and cooperation with private landowners. The County Trails Map delineates current and conceptual trails. Preservation of rare plant habitats and natural communities are Comprehensive Plan goals, and historic and cultural sites and resources will be identified and protected in the County. Preservation of identified natural areas, natural landmarks, riparian ecosystems, and critical wildlife habitats are key components of the *Boulder County Comprehensive Plan*.

Environmental Conservation Areas are large and relatively undeveloped areas of the County that possess a high degree of naturalness, contain high quality or unique landscape features, and/or have significant restoration potential. Size, quality, and geographic location make them an important tool for combating the affects [sic] of habitat fragmentation. Environmental Conservation Areas are delineated by the County as areas capable of meeting criteria of size, naturalness, ecological condition and quality, connectivity, and sufficient information.

Appendix 1.3: Public Involvement Process

Public Participation Opportunities List

An opportunity was provided at all the forums listed below for citizen comment. In general, public meetings were announced in newsletters, Channel 8 programs, the Visitor Plan website, the Visitor Plan hotline, and in paid advertisements placed in the Daily Camera. Public meeting notices and newsletters were placed in many cases at trailheads, community centers, and various locations around Boulder.

Winter 1998	Visitor Plan survey included in community workshop notice mailer and *Daily Camera* -- 121 returned.
Winter 1998	Researched other agency visitor plans.
February 11, 1999	KGNU's morning radio talk show to discuss plan and encourage participation.
February 11, 1999	Community workshop to discuss scope of project, existing information, and public involvement opportunities. Comment summary with responses created.
February 24, 1999	Open house and Open Space Board of Trustees (OSBT) meeting to discuss scope of project, comments and response from previous meeting, and public involvement opportunities.
June 1999	Set up Visitor Plan (VP) hotline, e-mail, fax line, and information placed on website with e-mail response option.
June 1999	Visitor Plan Citizen Advisory Committee (VPAC I) created to work with the Open Space staff to collect, analyze, and summarize information and public comments and present a report.
June 30, 1999	VPAC I discussed and modified phone survey.
July 14, 1999	OSBT discussed VPAC I suggestions; they were incorporated and then revised.
July 21, 1999	Ideas from VPAC I, OSBT, and public suggestions reviewed and incorporated into the final survey questions.
July-August 1999	1999 scientific public opinion phone survey conducted to assess the views and attitudes from all members of the public including those who do not attend public meetings.
August 1999	Channel 8 video about VP requesting citizen involvement.
September 1, 1999	VPAC I reviews survey results.
September 8, 1999	OSBT reviews survey results.
September 9, 1999	Community workshop to review survey results.
September-November, 1999	VPAC I met a number of times to discuss workshop comments, phone survey results, and develop a report.
September 22, 1999	OSBT reviews and provides direction on public workshop and VPAC I results.
October 27, 1999	OSBT reviews and provides direction on public input and VPAC I results.
November 18, 1999	Community workshop to review the initial work of the advisory committee and to look at what activities may be appropriate and under what circumstances.
March 22, 2000	VPAC I work complete after presenting Advisory Committee Report to OSBT. VPAC I dissolved.
January 1, 2001	Open Space and Mountain Parks merge into one department.
April-September 2001	Re-review comments from the Mountain Parks Visitor Use and Resource Protection Plan 1998 public forums and text from the plan.

October 2, 2001	Community workshop to review Advisory Committee Report and gather further input on the visitor issues for Open Space and Mountain Parks Department.
January - April 2002	Attended interest group meetings to explain how to be involved and Special Protection Area process. Groups included: Flatirons Climbing Council (met a number of times), boulderers, Sierra Club, Boulder off Road Alliance (BOA), Friends Interested in Dogs and Open Space (FIDOS), Boulder Area Trails Coalition (BATCO), PLAN Boulder, hang/para gliders, Boulder County Horse Association (BCHA), Boulder County Nature Association (BCNA), Audubon, and Colorado Mountain Club.
January 23, 2002	OSBT updated about interest group meetings, opportunity for public comment.
February 13, 2002	OSBT updated about meeting with disbanded Visitor Plan Advisory Committee VPAC I members, opportunity for public comment.
February 20, 2002	Met with disbanded Visitor Plan Advisory Committee members to update them on process and to discuss Special Protection Areas and how to define recreational experience.
April 19, 2002	OSBT annual retreat update on management strategies.
July 10, 2002	OSBT updated on the need for additional analysis before the plan is released.
July 31, 2002	OSBT updated on staff work including a communications plan.
August 28, 2002	OSBT updated on staff work in including recreational needs assessment, activity assessment, trail assessment, and cultural resources.
September 11, 2002	OSBT updated on planning strategies.
September 25, 2002	OSBT presented with passive recreation trend analysis.
October 9, 2002	OSBT presented with 1975 mountain backdrop carrying capacity document and acting City Manager feedback on trend analysis.
November 2002	New web “short-cut” page address obtained (visitorplan.com)
December 11, 2002	OSBT study session to prepare for City Council study session including the second Visitor Plan Advisory Committee (VPAC) II charter and make-up.
January 14, 2003	City Council/OSBT study session on visitor plan management concepts and VPAC II.
January 22, 2003	OSBT appoints second VPAC II including the group’s mission, timeframe, and membership. Nine committee meetings and two community forums were held with the opportunity for input at each meeting. VPAC II hosted two general discussion forums for additional public input.
June 2003	VPAC II presents its report to OSBT.
October 9, 2003	Open house and Open Space Board of Trustees meeting that facilitated interest group presentations of their proposed management area maps and management strategies. Staff worked with group representatives using OSMP Geographic Information Systems computer technology to draft maps.
Late 2003- early 2004	OSBT updates at all meetings with the opportunity for public comment.
January and February 2004	Meetings with interest group representatives to set-up community group meeting process to review the Draft Visitor Master Plan.
April 26, 2004	Community Group Forum meets for the first of eight meetings. Groups included: Boulder Area Trails Coalition, Boulder County Audubon, Boulder County Nature Association, Boulder County Horse Association, Boulder Off-Road Alliance, Boulder Trail Runners, Colorado Mountain Club, Flatirons Climbing Council, Friends Interested in Dogs and Open Space, Friends of Open Space Access, PLAN Boulder County, Rocky Mountain Hang Gliding & Paragliding Association, and Sierra Club.
April 28, 2004	OSBT is briefed on 2004 scientific public opinion phone survey that documented attitudes and preferences of Boulder residents.

May 11, 2004	City Council/OSBT study session on planning framework, public process, and issue identification.
May 26, 2004	Draft Visitor Master Master Plan presented to OSBT with public comment opportunity.
June 9, 2004	OSBT Visitor Master Plan Public Comment.
June 28, 2004	Community Group Forum presents its report to OSBT.
July 14, 2004	OSBT study session on precautionary principle, competitive events, dogs, commercial use, and user fees.
September 8, 2004	OSBT review and consideration of public comments for plan direction.
December 14, 2004	City Council/OSBT study session.
January 26, 2005	OSBT meeting and public comment on issues referred from City Council including management areas, dealing with uncertainty, and dog management.
February 23, 2005	OSBT reviewed and adopted final draft Visitor Master Plan following public testimony.
March 17, 2005	Planning Board reviewed and recommended final draft Visitor Master Plan following public testimony.
April 5, 2005 and April 12, 2005	City Council reviewed and accepted Visitor Master Plan following public testimony.
May 24, 2005	City Council reviewed and accepted Visitor Master Plan Implementation

Appendix 4.1: Detailed Information on Management Areas

Process Used in Developing the Open Space and Mountain Parks Management Areas

Delineating the Open Space and Mountain Parks land system into management areas is based on information overlays and professional judgment about the recreational and resource values of an area. When analyzing these suitability factors to delineate an area, consideration of the larger landscape context is required, i.e., the functional relationships or interactions among areas and how surrounding areas are managed. The practicalities of implementing varied management strategies among different areas need to be taken into account in the area designation process.

The concepts and map boundaries for the Open Space and Mountain Parks area management system were developed through staff collaboration and public participation. An interdisciplinary staff team conducted a visitor use-resource inventory and impact assessment process. The outcomes of this process were: a documentation of the co-location of resource values and visitor use, an assessment of where there are existing or anticipated impacts that the Visitor Master Plan should address, and a designation of management areas with shared management strategies. The specific steps included:

- Identification of areas with existing and anticipated visitor use and facilities.
- Identification of significant natural, agricultural, and cultural resources. Natural resources included: unique ecosystems, critical wildlife habitats, rare and sensitive plant communities, riparian and wetland areas, forest interior habitat areas and mature forest areas, and large habitat blocks.
- Identification of areas of potential compatibility and conflict.
- Analysis of specific threats and impacts.
- Identification of management areas and appropriate management strategies.

Expectations/Intentions

- Open Space and Mountain Parks Management Areas are intended to support both the provision of high quality visitor opportunities and reduction of resource impacts from these visitor activities.
- Designating management areas should make implementation of strategies more feasible and make on-the-ground management understandable for visitors.
- Management Areas provide coarse-level strategies to protect resources.
- The best information available will be used to define Management Areas.

✓ **Indicates a significant presence of the criteria attribute**

Passive Recreation Areas	**High level of visitation**	**Trails and trailheads for high use**	**High density of trails**	**Multiple-activity destination(s)**	**Opportunities for coordinating recreational activities/trail linkages**
Western Boulder County	✓	✓		✓	✓
Lefthand Canyon	✓	✓	✓	✓	
Boulder Valley Ranch	✓	✓	✓	✓	✓
Wonderland	✓	✓	✓	✓	✓
Sanitas Valley/Red Rocks	✓	✓	✓	✓	✓
Elephant Buttress	✓	✓	✓	Mostly climbers	
Flagstaff/Chautauqua	✓	✓	✓	✓	✓
South Mesa	✓	✓	✓	✓	✓
West Marshall Mesa	✓	✓	✓	✓	Ped underpass needed
Dry Creek	✓	✓	✓	Mostly dog walkers	✓
Gunbarrel/Heatherwood PRA	✓	✓	✓	✓	✓

✓ **Indicates a significant presence of the criteria attribute**

Natural Areas	**Interspersed recreational and natural values**	**Relatively high resource values**	**Relatively high recreational values**	**Opportunities for coordinating habitat protection and recreational activities/trail linkages**
Northern Tier	✓	✓ In some pockets		
East Beech	✓	✓	✓	✓
Sanitas	✓	✓	✓	✓
Anemone Hill	✓	✓	✓	✓
Flatirons/Mountain Backdrop	✓	✓	✓	✓
Shanahan	✓	✓	✓	✓
Doudy Draw	✓	✓	✓	✓
East Marshall Mesa	✓	✓	✓	✓
South Boulder Creek	✓	✓	✓	✓
East Boulder	✓	✓	Potential trail linkage	✓
Creek Confluence	✓	✓	Potential trail linkage	✓
Valmont Reservoir	✓	✓		
Diagonal	✓	✓		✓
Gunbarrel/Heatherwood NA	✓	✓	✓	✓
Outlots	Variable	✓ In some pockets		

✓ **Indicates a significant presence of the criteria attribute**

Agricultural Areas	**Crop production/irrigated hay fields/grazing areas**	**Agricultural efficiency/visitor safety conflicts**	**Opportunities for coordinating agricultural protection and recreational activities/trail linkages**
East Boulder Valley	✓	✓	✓
North Boulder Valley	✓	✓	✓

✓ **Indicates a significant presence of the criteria attribute**

Habitat Conservation Areas	**Large habitat blocks/low density of trails, roads, development**	**High ecosystem restoration potential**	**Rare or unique plant communities**	**Habitat for threatened, endangered, or rare species**	**Areas with high biodiversity**	**Comparatively lower visitation levels**	**Opportunities for coordinating habitat protection and recreational activities/trail linkages**
North Foothills	✓	✓	✓	✓	✓	✓	✓
Western Mountain Parks	✓	✓	✓	✓	✓	✓	✓
Eldorado Mountain	✓	✓	✓	✓	✓	✓	✓
Jewel Mountain	✓	✓	✓	✓	✓	✓	✓
Southern Grasslands	✓	✓	✓	✓	✓	✓	✓
Tallgrass Prairie East	✓	✓	✓	✓	✓	✓	✓
Sombrero Marsh		✓	✓	✓	✓		✓
Cottonwood Grove		✓	✓	✓	✓	✓	
Lower Boulder Creek	✓	✓	✓	✓	✓	✓	

Open Space and Mountain Parks Management Areas and Their Relationship to Boulder County Comprehensive Plan Environmental Conservation Areas

As defined in the *Boulder County Comprehensive Plan Environmental Resources Element* (Boulder County 1995), Environmental Conservation Areas are "large and relatively undeveloped areas of the County that possess a high degree of naturalness, contain high quality or unique landscape features, and/or have significant restoration potential. Their size, quality, and geographic location make them an important tool for combating the effects of fragmentation."

Primary factors used to evaluate potential Environmental Conservation Areas include:

- Naturalness--Relatively undeveloped landscapes offer greater opportunities for maintaining natural processes, protecting sensitive and wide-ranging animal species, and minimizing landscape fragmentation caused by development and roads.
- Quality and Uniqueness--This includes high quality plant communities such as native prairies or old-growth forests, and unique landscape features such as elk winter concentration areas and winter raptor concentration areas.
- Size--Bigger is better, more capable of supporting natural disturbance regimes, meeting the needs of wide-ranging animals, and protecting a mosaic of landscapes.
- Restoration Potential--Ability of a site to be restored to a native plant community and/or good wildlife habitat.

Mapping criteria for Environmental Conservation Areas:

- They should be centered on undeveloped landscapes and include high quality and unique landscape components as revealed in the biological and ecological assessment.
- Environmental Conservation Areas should be a minimum of 2,500 acres in size in order to be effective management units.
- They should cover all life zones and habitat types.
- Boundaries of Environmental Conservation Areas are influenced by the following:

    - The larger the Environmental Conservation Area, the greater probability of meeting the needs of wide-ranging species, allowing natural disturbance regimes, and minimizing adverse impacts from development. Environmental Conservation Areas should include all contiguous undeveloped land and nodes of high quality or unique landscape features.
    - Boundaries should avoid areas with significant existing development.
    - The shape should minimize fragmentation and edge effects.
    - The shape and geographic location of Environmental Conservation Areas should facilitate connectivity within the regional landscape.

Habitat connectors or wildlife movement corridors between Environmental Conservation Areas should be preserved--riparian and stream ecosystems, large-mammal migration corridors, and undeveloped land around Environmental Conservation Areas that provide a matrix of dispersal and movement options for wildlife. Land uses around Environmental Conservation Areas should be low intensity to buffer the impacts of development.

The Environmental Conservation Area designation has provided an important context for defining Open Space and Mountain Parks management areas.

Open Space and Mountain Parks Management Areas	Boulder County Environmental Conservation Areas
Passive Recreation Areas	**Environmental Conservation Area**
• Western Boulder County	Indian Peaks
• Lefthand Canyon	North St. Vrain/Foothills
• Boulder Valley Ranch	Boulder Valley Ranch/Beech Open Space
• Wonderland	
• Sanitas Valley/Red Rocks	
• Elephant Buttress	
• Flagstaff/Chautauqua	Boulder Mountain Park/South Boulder
• South Mesa	Boulder Mountain Park/South Boulder
• West Marshall Mesa	Boulder Mountain Park/South Boulder
• Dry Creek	
• Gunbarrel/Heatherwood PRA	White Rocks/Gunbarrel Hill
Natural Areas	**Environmental Conservation Area**
• Northern Tier	North St. Vrain/Foothills
• East Beech	Boulder Valley Ranch/Beech Open Space
• Sanitas	
• Anemone Hill	
• Flatirons/Mountain Backdrop	Boulder Mountain Park/South Boulder
• Shanahan	Boulder Mountain Park/South Boulder
• Doudy Draw	Boulder Mountain Park/South Boulder
• East Marshall Mesa	Boulder Mountain Park/South Boulder
• South Boulder Creek	Boulder Mountain Park/South Boulder
• East Boulder	
• Creek Confluence	Stream connection with Environmental
• Valmont Reservoir	Conservation Areas
• Diagonal	
• Gunbarrel/Heatherwood NA	White Rocks/Gunbarrel Hill
• Outlots	
Agricultural Areas	**Environmental Conservation Area**
• East Boulder Valley	
• North Boulder Valley	Boulder Valley Ranch/Beech Open Space
Habitat Conservation Areas	**Environmental Conservation Area**
• North Foothills	Boulder Valley Ranch/Beech Open Space
• Western Mountain Parks	Hawkin Gulch/Walker Ranch/Upper Eldorado Canyon and Boulder Mountain Park/South Boulder
• Eldorado Mountain	Hawkin Gulch/Walker Ranch/Upper Eldorado Canyon and Boulder Mountain Park/South Boulder
• Jewel Mountain	
• Southern Grasslands	Boulder Mountain Park/South Boulder
• Tallgrass Prairie East	Boulder Mountain Park/South Boulder
• Sombrero Marsh	
• Cottonwood Grove	
• Lower Boulder Creek	White Rocks/Gunbarrel Hill

Detailed Information on Management Areas

Note: *References (i.e., information sources such as plans, reports, and studies) are numbered and identified at the end of the appendix.*

Passive Recreation Areas

Western Boulder County Passive Recreation Area

References: 4, 11

Natural Resources

- The 4th-of-July campground property includes sub-alpine forest, wet meadow, and riparian habitats. The campsites are undefined and located in a riparian area, conditions that have caused significant degradation. Located in the Indian Peaks Environmental Conservation Area, designated in the Boulder County Comprehensive Plan.
- Boulder Falls is a unique waterfall feature at the bottom of North Boulder Creek before it joins with Boulder Creek. The area around it is forested and rocky.

Recreational Use

- Both the 4th-of-July campground and Boulder Falls are physically distant from other Open Space and Mountain Parks lands but have high levels of visitation, easy auto access, intense concentration of use, and developed facilities (i.e., trailheads, trash pick-up, and a pit toilet for the campground). Both are regional destinations--the campground a major trailhead and gateway to the Indian Peaks Wilderness Area, and Boulder Falls a scenic water feature. Both require coordination with adjacent land uses (Boulder County and U.S. Forest Service). Both have adjacent sensitive habitat (riparian and aquatic habitats).
- Dogs are required to be on-leash or under voice-and-sight control in this management area (no change).
- Operation and maintenance of these properties require long travel times for rangers and maintenance staff. This situation results in inefficient use of staff time and resources, and also less staff presence and lowered level of services for visitors.

Management Issues

- The need to redesign and refurbish the campground (or close it) to keep visitors on hardened surfaces and out of the riparian area.
- The constant threat of injury from visitors who want to climb up above the falls over very difficult terrain. A regulatory closure is in place and requires constant monitoring.
- Boulder County and the U.S. Forest Service were not interested in taking over the management of these properties in the past.

Recommended Management Actions

- Actively work to transfer the management and/or ownership of 4th-of-July campground and Boulder Falls, the two satellite Open Space and Mountain Parks properties that are far removed from the Boulder Valley, to another public agency that can provide excellent visitor services with greater efficiencies in operation and management. Alternatively, explore the benefits and feasibility of contracting out the day-to-day management of the properties.
- Make improvements to the 4th-of-July campsite to define the campsites and remove them from the riparian area.

Lefthand Canyon Passive Recreation Area

References: 4, 11, 14

Natural Resources

- From the mining claim donated to the city of Boulder, Open Space and Mountain Parks owns a strip of land along Lefthand Creek of about two miles long and a wider parcel across from the Palisades cliffs. It includes riparian, montane forest, and rock ecosystems. Lefthand Creek is an important wildlife movement corridor. Located in the North St. Vrain/Foothills Environmental Conservation Area.
- Golden eagles nest on top of the Palisades cliff formation, and a wildlife closure is in effect when nesting occurs.

Recreational Use

- Visitor facilities along Lefthand Creek include several road pull-outs, picnic tables, a pit toilet, and trails. This management area is not a year-round high-use area, but it receives a significant amount of concentrated visitor use during the good-weather months of the year.
- Dog management is on-leash or voice-and-sight control (no change).
- Currently this management area is closed for public use dusk to dawn (which is different from other Open Space and Mountain Parks areas).

Management Issues

- This management area receives less patrol or other services because of the site's remote location, which makes it difficult to provide adequate services.
- Many of the pull-offs beyond Buckingham Park are used to access property not in the Open Space and Mountain Parks system.

Recommended Management Actions

- Develop efficient ways to monitor visitor use and provide patrol in this isolated location.

Boulder Valley Ranch Passive Recreation Area

References: 4, 7, 8, 13, 14

Natural Resources

- Grassland, shrubland, and riparian habitats are present. Parts of the management area are shale barren prairie, bluffs, and drainages. The grassland community includes a diversity of native and non-native grassland types. Parts of the management area contain rare and sensitive plant communities listed by the Colorado Natural Heritage Program, including needle-and-thread grass mixed grass prairie, New Mexican feather grass mixed grass prairie, and Bell's twinpod (*Physaria bellii*) habitat. Located in the Boulder Valley Ranch/Beech Open Space Environmental Conservation Area.
- Nesting habitat for northern harriers and winter raptor habitat occur along the Eagle Trail and in other nearby drainages.
- Prairie dog colonies are present in the southern and northwest portions of the management area.
- Eagles and hawks perch and hunt near the prairie dog colonies.
- Mesa Reservoir, with an extensive riparian habitat and open water, attracts many different kinds of mammals, birds, and other animals. The public is asked to stay out of the area, but there is no formal public closure.
- The BLIP ponds are important native fish refugia.

Recreational Use

- This management area receives a high level of use by hikers, dog walkers, bicyclists, and horseback riders.
- The density of trails is very high in the northern portion of the management area.
- Dog management is on-leash or voice-and-sight control (no change).
- A significant amount of off-trail use has created a network of undesignated trails.
- Trail widening and braiding in areas are a significant problem in this management area.

Management Issues

- The high amount of off-trail use (especially in the southeast portion of the management area) exposes some of the native grassland communities and riparian areas to trampling, soil erosion, and weed dispersal.
- Dogs roam off-leash in prairie dog and riparian areas. The designated trails in this management area criss-cross through a prairie dog colony where very few dog handlers control their dogs.
- A significant conflict exists between off-leash dogs and livestock, and to some extent off-trail visitor use and crop production. The problem of dogs harassing cattle is especially acute during the calving season.

Recommended Management Actions

- Where needed, better define the trail corridor to avoid trail widening.
- Close and restore undesignated trails to protect shale barrens and Bell's twinpod habitat.
- Consider dog on-leash requirement for the Degge/Hidden Valley prairie dog colony.
- Implement seasonal on-leash requirements, where needed, to reduce dogs harassing cattle.

Wonderland Passive Recreation Area

References: 8, 10, 13, 14, 16, 34

Natural Resources

- The Dakota hogback is an important transitional (ecotonal) area between the mountains and the plains. The management area includes xeric tallgrass communities that are important for rare butterflies (such as arogos skipper, two-spotted skipper, and cross-line skipper). Parts of the management area contain rare and sensitive plant communities listed by the Colorado Natural Heritage Program, including needle-and-thread grass mixed grass prairie, New Mexican feather grass mixed grass prairie, and Bell's twinpod (*Physaria bellii*) habitat.
- A mix of grassland, shrublands, forests, and riparian habitats are present.
- Wonderland Lake is important habitat for fish, birds, mammals, and amphibians.
- Prairie dog colonies are present north of Wonderland Lake and west of the Foothills Community Park, and also northwest of the intersection of U.S. 36 and Broadway (which is part of a designated Prairie Dog Habitat Conservation Area).

Recreational Use

- Very high level of visitation by hikers, bikers, and dog walkers.
- Dogs are required to be on-leash in this management area, except for the section of the Foothills Trail north of Lee Hill Road (no change).
- Fishing occurs along the Wonderland Lake dam and peninsula.
- The paragliding site is used frequently. Currently it is the only site open to this activity.
- Close proximity to, and easy access from, a large and dense residential area and a community park (which includes a dog park).

Management Issues

- Popular for dog walking and biking, which causes some conflicts. This management area requires a constant high level of patrol to maintain compliance.
- Current lack of sustainable access for hang gliders and paragliders (trails and launch sites).
- Rapid expansion of jointed goatgrass is occurring along most of the current designated and undesignated trails and on each paragliding launch sites.
- Dogs roam off-leash in prairie dog colonies.
- Dogs swimming in Wonderland Lake (illegally off-leash).
- Ice skating (no regulation prohibiting being on ice).
- No regulatory closure on public access to the Wonderland Lake marshes.

Recommended Management Actions

- Continue the requirement for dogs on-leash.
- With the cooperation of the user groups, create and maintain sustainable paragliding-specific trails and launch site.
- Implement a no-dog requirement on the paragliding trails and launch site.
- Focus concentrated efforts on control and elimination of jointed goatgrass and other non-native species along trails and on launch sites.

Sanitas Valley/Red Rocks Passive Recreation Area

References: 10, 11, 13, 14, 16, 20

Natural Resources

- This management area is a transitional (ecotonal) area between the mountain and the plains. The Dakota hogback, hogback valley, and the ridge that the Sanitas Trail follows contain a diverse mix of grassland, shrubland, forest, riparian, and rock habitats. The management area includes xeric tallgrass communities (mostly on upper, rocky portions of slopes), which are important for rare butterflies (such as arogos skipper, two-spotted skipper, and cross-line skipper).
- The Red Rocks cliff formations are unique scenic geologic features.
- A falcon nest is located on Sanitas Ridge and is affected by a wildlife closure when nesting occurs.

Recreational Use

- A very high-use area, with a high density of trails in many parts.
- A very popular dog walking area. Dog management is on-leash or voice-and-sight control (no change).
- Close proximity to, and easy access from, residential development.

Management Issues

- Hikers on the Silver Lake Ditch are causing significant erosion along the ditch banks, undermining the integrity of the ditch and causing the need for ditch maintenance.
- Sunshine Canyon Road/Mapleton Ave. is a dangerous street for pedestrian crossing, and the diagonal on-street parking at the trailhead is a safety concern. Safety issues and parking congestion are significant and need to be addressed at the Mt. Sanitas trailhead. Possible expansion of the Centennial trailhead parking, elimination of the Mt. Sanitas on-street parking, and providing a safer pedestrian crossing are alternatives that are being considered to address these issues.
- The amount and intensity of use have created significant trampling effects to the vegetation, wider trails, and a number of undesignated trails. People and dogs going off-trail in riparian areas have caused vegetation loss and erosion and probably reduced presence of native wildlife.

- Non-compliance with voice-and-sight and dog poop pick-up regulations is still significant. Dog excrement is a major and well-documented issue in this management area.

Recommended Management Actions
- Evaluate, close, restore, and monitor existing undesignated trails that run from the bottom of the valley straight up the slope to the upper part of the trail.
- Continue to direct visitors and their dogs to stay out of the Silver Lake Ditch.
- Provide solutions for safe visitor road crossings and trailhead parking.
- Continue to provide a higher level of educational outreach and enforcement to improve dog management.

Elephant Buttress Passive Recreation Area

References: 11, 14, 20

Natural Resources
- A series of rocky towers and crags alongside Boulder Creek and Highway 119.

Recreational Use
- A very popular climbing area in Boulder Canyon, with multiple climbs in a very accessible, relatively small area. Can be very congested during high-use periods.
- Dog management is on-leash or voice-and-sight control (no change).

Management Issues
- Climbers access some of the climbs and cross Boulder Creek by walking on the Silver Lake Ditch. The Ditch Company has concerns about the level of this type of use.
- Parking alongside Highway119 in Boulder can be congested, and pedestrian crossing of the road can be dangerous.

Recommended Management Actions
- Continue to direct visitors to stay off of the Silver Lake Ditch pipeline.

Flagstaff/Chautauqua Passive Recreation Area

References: 4, 5, 10, 11, 14, 15, 16, 19, 20, 21, 22, 24, 25, 27, 30, 31, 34

Natural Resources
- The Flagstaff Mountain area and Chautauqua/lower Gregory Canyon area below the Flatirons contain many high-value natural resources, including relatively wet and productive forests, pockets of old growth forest, mountain riparian corridors that include some large stands of shrubs, and wet meadows that contain mixed-grass, tallgrass, and other plant communities that are relatively rare on the dry Front Range. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.
- In spite of the proximity to the city and developed facilities on the Flagstaff summit, this management area provides high quality habitat for forest birds, Abert's squirrels, and occasional weasels, bobcats, black bears, and mountain lions. Some of the riparian zones harbor rare and sensitive plant species (such as birdsfoot violet, chaffweed, smilax, grassfern, Wright's cliffbrake, and wavy-leaf stickleaf, and the hazelnut community), and they provide fruits and berries for bears in the fall. The management area also provides habitat for some of the rare butterflies (such as hops blue, regal fritillary, others) that utilize foothills/montane vegetation there.
- Places like Enchanted Mesa provide exceptional forest bird habitat that supports a wide diversity of neo-tropical migrant and other forest bird species.

- The management area contains many high quality riparian corridors, which harbor a diverse set of species and provide wildlife travel corridors (Bluebell, Gregory, and Skunk creeks in particular).

Recreational Use

- Chautauqua Meadow is a gateway to one of the most heavily used portions of Mountain Parks. Casual hiking, running, and dog walking are very popular, and Chautauqua is a jumping off point for serious hiking and climbing in the Flatirons region. The Chautauqua Ranger Cottage is a well-used public information center for Open Space and Mountain Parks and the Chautauqua Association. Chautauqua Park, a multiple-use recreational and cultural center managed by the Boulder Parks and Recreation Department, draws visitors to the greater Chautauqua area.
- Flagstaff Road visitor use includes a significant amount of auto sightseeing and scenic viewing. In addition, Flagstaff Road is one of the highest draw destinations for bouldering in the Open Space and Mountain Parks system.
- Parts of Chautauqua Meadow are designated sledding areas.
- Dog management is on-leash or voice-and-sight control, except dogs are prohibited on the Upper McClintock Trail (no change). Dogs are required to be on-leash on the adjacent National Institute of Standards and Technology (NIST) and National Center for Atmospheric Research (NCAR) properties (federal requirement, no change).
- Enchanted Mesa, Kohler Mesa, the Flagstaff summit area, and the Flagstaff Road corridor (with scenic view pull-outs and picnic tables) all receive very heavy visitation. Flagstaff Road and Summit offer many spectacular scenic viewpoints, which attract many visitors.
- The Flagstaff Summit area contains many trailheads, group picnic shelters, the Flagstaff Sunrise Amphitheater, the Flagstaff Nature Center, pit toilets, water spigots, and other facilities designed to accommodate large numbers of visitors. The area is heavily used by both residents and destination visitors. The Flagstaff Summit Road is closed six months of the year to preclude snow plowing and other services during the winter and to provide the area with a season of rest from large numbers of people and vehicles.
- This management area contains the Flagstaff Mountain Cultural Landscape District, which is designated by Boulder County because of the cultural and heritage value of its recreational structures and associated historic context. These structures were either constructed by the Civilian Conservation Corps or constructed with similar Civilian Conservation Corps architectural style.
- The Flagstaff/Chautauqua management area is in close proximity to, and is easily accessed from, intensive residential development.

Management Issues

- Chautauqua Meadow experiences crowding in the parking lot and sometimes on the trails. Parking can back-up into the neighborhoods during high-use times, especially when events are occurring at the adjacent Chautauqua Park.
- Many people do not realize how many rare and sensitive plants are in Chautauqua meadow. Many people travel off-trail in the meadow, and the challenge of preventing, eradicating, and restoring undesignated trails is ongoing.
- Dog walking is a very popular activity in Chautauqua Meadow, and it adds to congestion and occasional conflict with other visitors. Non-compliance with voice-and-sight and dog poop pick-up regulations is still significant. Dog excrement is a major and well-documented issue in this management area.
- Enchanted Mesa has numerous undesignated trails, some of which could be designated but others still need to be removed.
- Gregory Canyon and Skunk Canyon may have temporary closures when bears are feeding there, and sometimes the bears, people, and their dogs come in close proximity to each other.
- Group activities, such as large group picnics and weddings, sometimes result in crowds that can then spillover into off-trail areas.

- The Flagstaff Trail winds its way up the mountain and crosses Flagstaff Road in several places. These trail crossings carry a certain amount of risk with cars descending steep sections of the road.
- Mountain biking groups have advocated either opening some mountain backdrop trails to bikes or building a trail connection west of Highway 93 through the mountain backdrop to Walker Ranch or Boulder Canyon. Construction of any new bicycle trails west of Highway 93 will likely require City Council approval, because Council adopted regulatory changes in 1987 that closed trails that were previously open to bikes. The area affected by this closure included south of Sunshine Canyon, west of Broadway, and north of Eldorado Canyon.

Recommended Management Actions

- Improve the safety of Flagstaff Road crossings for the Flagstaff Trail.
- Require dogs on-leash in Gregory Canyon foothill riparian areas.
- Make decisions on which undesignated trails should be converted to designated trails, re-routed, or removed and restored.
- Consider a possible mountain bike (multi-use) trail corridor from the frontside to the backside of Mountain Parks.

South Mesa Passive Recreation Area

References: 4, 10, 13, 14, 16, 31

Natural Resources

- This management area includes a number of outstanding natural features: wetlands and riparian areas along South Boulder Creek and connecting drainages (including Shadow Canyon Creek), diverse shrublands, and open meadows. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.
- South Boulder Creek provides important transitional riparian vegetation between the montane and foothills zones and the plains. The shrublands provide high neotropical bird species richness. The meadows in this management area contain xeric tallgrass habitat for rare butterflies like the native hops blue butterfly. Dwarf leadplant (*Amorpha nana*), a rare plant listed by the Colorado Natural Heritage Program, is present.
- Because of the high densities of wildlife and seasonal bear feeding area in the riparian corridor, dogs are required to be on-leash on the Towhee Trail. Otherwise, dog management is on-leash or voice-and-sight control (no change).

Recreational Use

- This management area includes a number of popular loop trails that are very scenic. The trail density is relatively high, with the Mesa Trail, Towhee Trail, and Homestead Trail in close proximity. The South Mesa trailhead is a gateway to many popular trails in the southwest part of the Open Space and Mountain Parks system and is often congested. The trailhead is large, with parking, restroom, and picnic areas. Horseback riders frequently use this trailhead.
- Dog management is on-leash or voice-and-sight control, except dogs are required on-leash on the Towhee Trail (no change).
- This management area offers an opportunity for interpretation of early settler history. The Dunn Homestead is interpreted by a monument/sign.
- This management area is popular for interpretive and educational hikes and field classes.

Management Issues

- At times with high visitor numbers, this trailhead can be very congested, and parking regularly back ups onto Eldorado Springs Drive. Open Space and Mountain Parks rangers have no enforcement authority on Eldorado Springs Drive. Equestrians have requested additional horse trailer parking here.

- Non-compliance with voice-and-sight and dog poop pick-up regulations is still significant. Dog excrement is a major and well-documented issue in this management area.
- Along South Boulder Creek west of the trailhead parking area, the public is asked to stay out of the area, but there is no formal public closure. This area near the creek experiences a high level of off-trail use that has caused significant stream bank erosion.

Recommended Management Actions

- Develop a solution to lessen congestion and parking overflow at the South Mesa trailhead.
- Consider a solution to better accommodate horse trailers.
- For safety reasons, work with the County Sheriff to enforce the no-parking requirement on Eldorado Springs Drive.

West Marshall Mesa Passive Recreation Area

References: 4, 10, 13, 14, 16

Natural Resources

- This management area is the farthest extension of foothills forest into the prairie margin of any area in the Open Space and Mountain Parks system. Because of increased elevation and slightly higher moisture conditions, this management area includes patches of ponderosa pine forest, a rich diversity of shrubs, and relatively wet meadows and savannas. Riparian areas are present in the Cowdry drainage and along the ditches, and wetlands exist in low-lying areas. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.
- While this management area was severely disturbed by mining activity in the 19th and 20th centuries, native plant communities have recovered in some areas. The management area includes xeric tallgrass communities (mostly on upper, rocky portions of slopes), which are important for rare butterflies (such as arogos skipper, two-spotted skipper, and cross-line skipper). Birdsfoot violet (*Viola pedatifida*), a rare plant listed by the Colorado Natural Heritage Program, is present.
- Marshall Mesa geology includes sandstone outcrops, plant fossils, and a coal seam. Evidence from historic Marshall Mesa coal mining activities is present, and interpretative signs provide highlights to visitors.

Recreational Use

- This management area has become very popular, with a large number of hikers, dog walkers, bikers, runners, and horseback riders.
- An extensive network of undesignated trails has developed here. The growth in use in recent years has been steep, paralleling the growth in the neighboring communities of Louisville and Superior.
- Dog management is on-leash or voice-and-sight control (no change).

Management Issues

- Non-compliance with voice-and-sight and dog poop pick-up regulations is still significant. Dog excrement is a major and well-documented issue in this management area.
- Trail cutting on steep slopes has caused soil erosion, as has the trail widening on both the biking-allowed and biking-prohibited trails. In particular, the multi-purpose trail has seen creation of parallel trails and severe widening and erosion in parts.
- Conflict between the different types of visitor activities has been a problem here.
- Trailhead parking frequently results in high congestion and backup parking along Marshall Drive. Vehicle egress from the parking lot can be difficult and dangerous given the high speeds and limited sight distances on Marshall Drive.

Recommended Management Actions

- Construct the pedestrian underpass from Marshall Mesa to the Community Ditch Trail (under Highway 93).
- Address safety and parking congestion problems at the Marshall Mesa trailhead. Consider a new trailhead at the City Limits property.

Dry Creek Passive Recreation Area

References: 7, 9, 13

Natural Resources

- This management area includes a riparian area along Dry Creek, some large trees used as perches by raptors, a prairie dog colony, and non-native hay fields.
- The north bank of the creek has small patches of higher quality riparian and wet meadow vegetation, including native loosestrife and other species that are often associated with Ute ladies' tresses (*Spiranthes diluvialis*).

Recreational Use

- Visitation here has increased dramatically in recent years. The growth in use parallels the growth in the neighboring communities of Louisville and Superior.
- This property is heavily used, primarily by dog walkers. To deal with the this high level of use, the prairie dog colonies were fenced off, much of the riparian zone was fenced off (south of Dry Creek), a second trash can was installed farther from the trailhead, and "hint" fences were installed to encourage visitors to stay out of the back field, which is in proximity to raptor perch trees. These hint fences have been unsuccessful in discouraging visitor use.
- Dog management is on-leash or voice-and-sight control (no change).
- At some point, this property will be connected to the Bobolink Trail and the proposed extension of the East Boulder Trail from Boulder Reservoir to Teller Farm.

Management Issues

- The high use of this management area by dog walkers has discouraged the activities of other visitors who are not accompanied by dogs. Where the riparian area has not been fenced off, heavy dog use occurs in the creek, with the result of extensive stream bank erosion and degradation of fish habitat.
- The amount and intensity of use have created significant trampling effects to the vegetation, wider trails, and a number of undesignated trails. Knapweed and other noxious plants are making inroads into the grassland, in part due to soil disturbance caused by visitor use.
- Non-compliance with voice-and-sight and dog poop pick-up regulations is still significant. Dog excrement is a major and well-documented issue in this management area.
- Conflicts with adjacent landowners are frequent and include fence cutting, trespassing, parking encroachment on private rights-of-way, and dogs out of control on private property. In addition, parking often overflows from the trailhead parking lot to County access and onto Baseline Road.

Recommended Management Actions

- Evaluate the damage occurring to the Dry Creek riparian area and consider options to solve the problem.
- Construct the new trail connection from Dry Creek to the Bobolink Trail and the extension of the East Boulder Trail from Boulder Reservoir to Teller Farm.
- Continue to provide a higher level of educational outreach and enforcement to improve dog management here.
- Continue education and enforcement efforts to reduce conflicts with adjacent landowners.

Gunbarrel/Heatherwood Passive Recreation Area

References: 4, 7, 13, 14, 35

Note: The Open Space and Mountain Parks lands in the Gunbarrel area have been placed into two management area designations: the Gunbarrel/Heatherwood Passive Recreation Area (south of Lookout Road, described in this section) and the Gunbarrel/Heatherwood Natural Area (north of Lookout Road, described in a separate section). These two management areas share many characteristics, with much of the land in dryland farming. However, the bulk of the passive recreational activity occurs in the Passive Recreation Area.

Natural Resources

- In the past, the land on Gunbarrel Hill and around Heatherwood (a large contiguous block of land) was farmed for dryland crops (mostly dryland winter wheat), and much of it was severely overgrazed. These damaged lands are now undergoing native grassland restoration under the federal Conservation Reserve Program. The soils on these dry wind-exposed sites did not support plowing and cropping in a sustainable manner, with the result that they became highly eroded. The restoration of these lands has involved the planting of native grasses and forbs. The different properties are in different stages of recovery, but they are all being managed to restore a sustainable native grassland ecosystem. The habitat values of these lands are slowly being restored with the natural stabilization of prairie soils and reestablishment of native plant communities.
- Other smaller blocks of non-Conservation Reserve Program properties are still cultivated with non-native hay crops, some are non-native pastures used for grazing, and some are fallow. The habitat values of grassland properties in this management area support many native bird species, as well as small mammals, including some prairie dog colonies. The management area also supports some wet meadows and wetlands along ditches and creeks. Located in the White Rocks/Gunbarrel Hill Environmental Conservation Area.

Recreational Use

- The overall level of visitation in this management area is moderate to high, given its proximity to the Gunbarrel/Heatherwood residential subdivisions. The East Boulder-Gunbarrel Farm Trail is adjacent to or close to several residential areas and is used by many hikers, dog walkers, bikers, and horseback riders. Visitation is moderate but consistent on the East Boulder Trail and on several undesignated trails.
- Dog management in this management area is predominately on-leash or voice-and-sight control with a few exceptions (no change). Dogs on-leash is required on two portions of the Cottontail Trail (no change). Dogs are prohibited on a portion of the Gunbarrel Trail (no change).
- There is a network of undesignated trails that receives a relatively high level of use, mostly radiating off of the Gunbarrel and Heatherwood residential subdivisions. A dense cluster of undesignated trails is located on the Wood Brothers and Kaufmann properties (on the south side of Heatherwood), and dog walking is extremely popular here. Many of these trails lead down to the north side of Boulder Creek (where a reinforced fence has now been installed to protect the creek). The undesignated trail on the Kolb property riparian area east of 75th Street is a concern. A network of undesignated trails has developed from the Heatherwood subdivision north to Lookout Road, through Conservation Reserve Program land (e.g., undesignated trails located on the Jenik, Cosslett, Haley, and Knaus properties).

Management Issues

- Due to environmental damage from overuse, the plethora of undesignated trails needs to be sorted out--which ones to close and reclaim, and which ones to relocate or designate officially. The situation on Wood Brothers and Kaufmann especially needs attention (off-trail uses include hiking, dog walking, sledding, and paintballing).

- Off-trail activities such as hiking, dog walking, and model gliding (Jenik property) may make it more difficult to prevent invasion of weeds and restore some of the Conservation Reserve Program lands.
- In certain areas, the grassland bird communities may need some protection from dogs during times of nesting (seasonal closures).

Recommended Management Actions
- Assess how to deal with undesignated trails around the Gunbarrel and Heatherwood subdivisions, eliminating and reclaiming, relocating, or converting to designated trails.
- Monitor, assess, and determine whether or not any restrictions on visitor access should be implemented to support the restoration of native grasslands on the Conservation Reserve Program lands.
- Require seasonal closures or dog exclusions to protect seasonal nesting of grassland birds.

Natural Areas

Northern Tier Natural Area

References: 4, 7, 8, 13

Natural Resources
- The Northern Tier management area includes a large number of properties, which are dispersed, vary in size, and vary in ecological condition. Most are agricultural properties, some of which are irrigated, some of which are still actively farmed or grazed, and some are fallow. Some are weedy and heavily grazed by prairie dogs and cattle, others are in good condition. The irrigated agricultural fields provide seasonal habitat for ground nesting birds. Located in the North St. Vrain/Foothills Environmental Conservation Area.
- Prairie dogs are present on a few properties.
- Some properties contain wetlands and riparian areas along ditches or creeks.

Recreational Use
- Most of the properties have an “unofficial” visitor access closure, until management plans and infrastructure are put in place. There is little visitor use currently.
- No visitor facilities are provided.

Management Issues
- Continuation of agriculture and/or restoration of degraded lands are a priority on many of these properties. Until these properties are planned for visitor use and provided with appropriate visitor facilities, it is important that the level of use remain low.

Recommended Management Actions
- Formally close properties to visitor use until visitor use management plans and visitor use facilities are completed.

East Beech Natural Area

References: 4, 7, 8, 13, 14

Natural Resources
- In this management area grassland, shrubland, and riparian habitats dominate. The grassland community includes a diversity of native and non-native grassland types. The Beech property (east of U.S. 36) receives infrequent prescribed grazing. The BLIP property is leased for more

frequent grazing. The grasslands provide seasonal habitat for ground nesting birds. Located in the Boulder Valley Ranch/Beech Open Space Environmental Conservation Area.

- Parts of this management area are shale barren prairie and contain rare and sensitive plant communities listed by the Colorado Natural Heritage Program, including needle-and-thread grass mixed grass prairie, New Mexican feather grass mixed grass prairie, and Bell's twinpod (*Physaria bellii*). The habitat here is somewhat fragmented because of old agricultural roads, designated trails, and undesignated trails.
- Parts of this management area are in need of restoration, and significant infestations of non-native invasive plants such as knapweed and Mediterranean sage are present. This concentration of Mediterranean sage is a part of the only population in the state of Colorado, and its eradication has been identified as a statewide priority.
- Most of the management area is included in a designated Prairie Dog Habitat Conservation Area, and there are many small, medium, and large active colonies.

Recreational Use

- This management area currently experiences a relatively low- to moderate-level of visitor use with hiking, biking, and horseback riding. Growth in use is increasing with growing popularity of the Boulder Valley Ranch area.
- Undesignated trails now spur off of the designated Lefthand Trail. The Beech Pavilion, which is managed by Boulder County, is located on the north end of the East Beech property.
- Dogs are prohibited in this management area, except dogs are allowed on-leash on the Lefthand Trail (no change).

Management Issues

- The growing density of undesignated trails could cause degradation in habitat quality and fragmentation of habitat patches. The threats posed by the spread of weeds are a significant problem in this management area.

Recommended Management Actions

- Make decisions on which undesignated trails should be converted to designated trails, re-routed, or removed and restored.
- Locate any new trails, if any, on the periphery of the existing habitat block.

Sanitas Natural Area

References: 10, 13, 14, 16, 31

Natural Resources

- Similar to the Anemone Natural Area, this management area includes ponderosa pine forest and savanna, shrublands, mountain meadows, and riparian areas. Some parts of the management area contain rare plant communities, including king spike fescue/ponderosa pine and xeric tallgrass prairie with associated rare butterfly habitat. Much of the management area is relatively dry with only moderately fertile soils; consequently, its vegetation is not quite as diverse as some other areas.
- This backcountry area provides a refuge for forest birds and small and large mammals.

Recreational Use

- While the adjacent Sanitas Valley area has a very high level of visitor use, the amount of current visitor use in this management area is comparatively lower and less intensive. There are no designated trails, but there is a network of undesignated trails, many of them leading from Sunshine Canyon and nearby residential subdivisions.
- Some of the undesignated trails are on steep slopes and may not be sustainable.
- Dog management is on-leash or voice-and-sight control (no change).

Management Issues

- The system of undesignated trails has led to a visitor use pattern that may not be sustainable.

Recommended Management Actions

- Make decisions on which undesignated trails should be converted to designated trails, re-routed, or removed and restored.

Anemone Hill Natural Area

References: 10, 11, 14, 16, 19, 20, 31

Natural Resources

- This management area includes ponderosa pine forest and savanna, shrublands, mountain meadows, and riparian areas. It is drier and has less fertile soils than areas like Enchanted Mesa; consequently its vegetation is not quite as diverse.
- This back-country area provides a refuge for forest birds and small and large mammals.

Recreational Use

- While the adjacent Red Rocks area has a very high level of visitor use, the amount of current visitor use in this management area is comparatively lower and less intensive. Anemone Trail (less than half a mile) is the only designated trail in this management area, but there is a network of undesignated trails. One of the undesignated visitor use corridors is the heavily eroded maintenance road for the Sunshine Canyon water supply pipeline owned by the city of Boulder Water Utility.
- Some of the undesignated trails are on steep slopes and are not sustainable.
- Dog management is on-leash or voice-and-sight control (no change).

Management Issues

- The system of undesignated trails has led to a visitor use pattern that may not be sustainable.
- Illegal bike use is a historic problem, and dead ends into private property resulting in trespass violations.

Recommended Management Actions

- Develop a new sustainable trail system and eliminate undesignated trails.

Flatirons/Mountain Backdrop Natural Area

References: 4, 10, 14, 16, 19, 20, 21, 22, 26, 31

Natural Resources

- This management area includes Boulder's scenic mountain backdrop and is a very popular visitor destination. It includes most of the land from the Mesa Trail to the high ridgeline of the mountain backdrop. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.
- This management area is primarily mixed coniferous forest and shrublands but also includes montane meadows and significant rock and cliff terrain. It includes the upper parts of several steep mountain canyons and associated riparian areas such as Gregory Canyon, Skunk Canyon, Bear Canyon, Fern Canyon, and Shadow Canyon.
- The foothills/montane forest and riparian corridors harbor diverse vegetation and many rare and sensitive plant communities such as grass fern, maidenhair spleenwort, hazelnut community, dwarf leadplant, smilax, calypso orchid, picture-leaf wintergreen, and birdsfoot violet. This management area contains several pockets of thick unbroken forest and also very old trees on steep inaccessible slopes.

- The cliff-face ecosystems are habitat for many unique and rare plants, including carrion flower (*Smilax lasioneuron*), ferns such as grass fern (*Asplenium septentrionale*), and many species of mosses and lichens. These ecosystems also provide bat roosting, maternity, and water hole sites, and many raptors nest on cliffs, such as golden eagles, peregrine falcons, and prairie falcons.
- This management area includes many avian habitats of special interest. Species of concern like northern goshawk and flammulated owls, denizens of intact mature forest, inhabit the area. It also includes bear browsing areas with important food sources.
- The federally listed Preble's meadow jumping mouse (threatened) inhabits Upper Bear Canyon.
- Contains important habitat for the state-threatened Townsend's big-eared bat and many other bats.
- Provides important habitat for many rare butterflies that inhabit foothills/montane meadows.

Recreational Use

- This management area, while more remote than many areas of Open Space and Mountain Parks, still encounters a significant amount of visitation. It is a destination for visitors who want to hike the steeper terrain, take advantage of terrific views of the plains, and rock climb. It includes geological destinations such as the Diatreme, the Flatirons, Saddle Rock, Royal Arch, and Mallory Cave. For most visitors climbing up to the high mountain park peaks, they will be accessing them from the east side in this management area.
- Rock climbing is a popular attraction for visitors in this management area, involving traditional and sport climbing and bouldering.
- Significant off-trail visitor travel occurs in this management area.
- The raptor cliff-nesting areas are closed seasonally (when occupied) to visitors for approximately six months of the year, which seasonally restricts off-trail hiking and climbing in several areas.
- Dog management is predominantly on-leash or voice-and-sight control, with some exceptions. Bear Canyon and Fern Canyon are now on-leash. Lower Skunk Canyon is now on-corridor voice-and-sight control. The Eldorado Canyon Trail is on-leash, in order to be consistent with dog management on those parts of the trail that connect with Eldorado Canyon State Park and Boulder County Walker Ranch (no change). Dogs are required year-round to be under on-corridor voice-and-sight control. Previously, dogs were seasonally required to be under on-corridor voice-and-sight control, in order to maintain compatibility with seasonal raptor closures.

Management Issues

- Trying to balance resource protection with high levels or concentrated use is difficult. Currently seasonal wildlife closures for raptors and bats are one effective tool used to deal with this dilemma.
- The lack of a sustainable climbing access trail system has resulted in the proliferation of undesignated trails and much damage to vegetation and soils on steep slopes, riparian areas, and cliff faces. Collaboration with the climbing groups to manage the climbing areas and establish sustainable climbing access trails in selected areas is needed to address these problems.
- Off-trail travel on steep slopes and rocky terrain may damage fragile vegetation. This is especially true where vegetation exists on rock faces and is exposed to rock climbing and bouldering.
- Many of the trails follow canyon streams that are very important for wildlife and contain vegetation that is especially susceptible to trampling. Right now there are no protective measures to ensure that rare and sensitive riparian plants are protected.

Recommended Management Actions

- Working collaboratively with the climbing community, develop a system of sustainable climbing access trails.

- Require dogs on-leash on Bear Canyon Creek Trail (the entire trail, including all three zones), as well as the Skunk Canyon Trail, and Fern Canyon Trail—in order to provide a higher level of resource protection in their foothill riparian areas.
- Institute an on-corridor voice-and-sight control requirement for Shadow Canyon and the connecting trail between Bear Peak and South Boulder Peak, in order to provide an off-leash option to Bear Peak and South Boulder Peak.

Shanahan Natural Area

References: 2, 3, 4, 6, 10, 13, 14, 16, 17, 31, 34

Natural Resources

Shanahan Ridge Area

- The Shanahan Ridge portion of this management area includes a diversity of habitats with a transitional foothills-plains grassland/savanna area and a relatively flat foothills forest area up to the Mesa Trail. Pockets of xeric and mesic tallgrass prairie are present in the meadows (and associated rare butterfly habitat). It possesses many of the same habitat qualities that are present in the Chautauqua area. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.
- This area includes the relatively pristine Fern Canyon meadow, which probably resembles Chautauqua Meadow before development built up around it.
- This area contains birdsfoot violet, dwarf leadplant, and other rare and sensitive plants.
- Parts of this area are excellent forest bird habitat, and many small and large mammals use the area. It includes an active prairie dog colony on the eastern portion—south of Shanahan Ridge and west of the Shanahan conservation easement.

Big Bluestem/South Boulder Creek Area

- A relatively large expanse of natural lands, consisting of a diverse transitional area between the foothills and the plains. At the western, highest elevation portion of the management area is a combination of patches of ponderosa pine and ponderosa/Douglas-fir forest and savanna/mountain meadows. Further to the east and downslope is a combination of shrublands, mixed grasslands, and extensive tallgrass patches. There are numerous riparian drainages and extensive South Boulder Creek floodplain areas where deer congregate. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area .
- Extensive and diverse upland shrublands and patches of tallgrass provide nesting, feeding, and hiding cover for birds and mammals. Black bears forage in the shrublands and along the stream drainages.
- A 100-acre section of the Colorado Tallgrass Prairie State Natural Area includes large concentrations of big bluestem, little bluestem, yellow Indiangrass, switchgrass, and prairie cordgrass.
- This area harbors several known rare plants (listed by the Colorado Natural Heritage Program) such as birdsfoot violet (*Viola pedatifida*) and dwarf leadplant (*Amorpha nana*, the largest known population in our section of the Front Range).
- Relatively rare butterflies associated with montane/foothill habitats and tallgrass habitats utilize this area.

Recreational Use

Shanahan Ridge Area

- This portion of the management area offers some easy plains and forest hikes adjacent to the Devil's Thumb and Shanahan Ridge neighborhoods. It is a very popular hiking and dog walking area and can be used as a jumping off point for visitors to hike and climb the peaks or to boulder (climb).

- Dog management is on-leash or voice-and-sight control (no change) in most of the Shanahan Ridge area, with the exception that dogs are required to be on-trail in the eastern portion of the area (no change).

Big Bluestem/South Boulder Creek Area

- This portion of the management area offers a diversity of habitats and relatively flat trails for visitors to enjoy with the scenic mountain backdrop.
- The amount of visitor activity by people, dogs, and horses is comparatively high and growing in this habitat-rich area. A significant number of visitors live in Shanahan Ridge, but this area is also a destination for other visitors.
- The mountain bicycling community has articulated the desire to allow bike use on the popular Big Bluestem-South Boulder Creek loop trails. At the same time, considerable opposition to this proposal by environmental advocates should be anticipated.
- Off-trail use has been expanding. A network of undesignated trails now exists, primarily from Shanahan Ridge south to the Big Bluestem Trail.
- On the Big Bluestem-South Boulder Creek loop trail, dogs are now required to be on-corridor voice-and-sight control. In the heart of the tallgrass areas, dogs are prohibited in off-trail areas (no change). In addition, the Big Bluestem Trail seasonally requires dogs to be on-leash, because of the bear feeding activity in the fall (no change).

Management Issues

Shanahan Ridge Area

- The lack of a formal trailhead creates some conflict over parking in the neighborhoods.
- Many undesignated trails exist from neighborhood access points.

Big Bluestem/South Boulder Creek Area

- A significant number of undesignated trails come off of Shanahan Ridge to the south, and off-trail use in the tallgrass areas is increasing. Widening of some of the designated trails is also occurring, which can cause soil erosion and spread of weeds.
- In the past, heavy grazing at certain times of the year degraded the health of the plant community and the aesthetics for visitors. However, recent changes in grazing practices have improved the situation.
- Seasonal dog leash requirements have had a low level of compliance on the Big Bluestem Trail.

Recommended Management Actions

Shanahan Ridge Area

- Reconsider the need for and feasibility of a new trailhead on Shanahan Ridge.

Big Bluestem/South Boulder Creek Area

- Evaluate, close or retain, restore, and monitor undesignated trails, especially those from Shanahan Ridge.
- The Big Bluestem/South Boulder Creek loop trail is proposed for a voice-and-sight compliance study area, which will evaluate whether or not changes to dog management regulations are needed.
- To improve grassland health and aesthetics, remove cattle grazing when the current leases are terminated, except for prescribed grazing to achieve resource objectives.
- Closely monitor this area to ensure that any undue impacts do not occur as a result of visitor use.
- Develop and implement a restoration plan for this area to ensure that the health of the ecosystem is restored.

Doudy Draw Natural Area

References: 4, 7, 10, 13, 14, 15, 16, 24, 26, 28, 29, 31, 34

Natural Resources

- This management area is a relatively large expanse of natural lands, with mixed grasslands in the north and east, and ponderosa pine forest and savanna in the southwest. The habitat is largely unbroken--penetrated by only two designated trails (Community Ditch and Doudy Draw), and the power line maintenance road. Highway 93 and the Greenbelt Plateau Trail are located on the eastern margin. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.
- It includes some very extensive and diverse north-facing shrub communities in the uplands, forest meadows and outwash mesa tops with xeric tallgrass, and riparian areas for portions of Doudy Draw and some other drainages. The management area also includes several pockets of forest interior habitat and mature forest. (Mature forest conditions include a mix of characteristics such as large trees, old trees, multiple tree canopy layers, forest canopy openings, and diversity in tree size, density, species type, and age). Species of concern such as northern goshawk and flammulated owls, denizens of intact mature forest, may inhabit the area.
- The Doudy Draw Natural Area harbors several known rare plants such as the federally-threatened Ute ladies'-tresses orchid (*Spiranthes diluvialis*), and birdsfoot violet (*Viola pedatifida*) and dwarf leadplant (*Amorpha nana*), which are both listed by the Colorado Natural Heritage Program. In addition, the area contains a rare plant community listed by Colorado Natural Heritage Program (Ponderosa pine/Big bluestem, mountain mahogany). This occurrence area is the most southerly extent of mountain mahogany on Open Space and Mountain Parks lands.
- The management area includes a diverse transitional area between the foothills and the plains. As such the area has high habitat values for birds and mammals. Relatively rare butterflies associated with montane/foothill habitats and tallgrass habitats utilize this area.
- Doudy Draw is an important bear habitat and an avian habitat of special interest (especially the upland shrub habitat). The management area also includes a large active prairie dog colony, which is part of a designated Prairie Dog Habitat Conservation Area
- There are several drainages that provide riparian habitat, that harbor many different species including threatened Preble's meadow jumping mouse.
- Lindsay Pond, and possibly other wetland areas, harbors northern leopard frogs, which are a state-threatened species. Lindsay Pond also harbors a large concentration of painted turtles.

Recreational Use

- This management area offers a diversity of habitats and relatively flat trails for visitors to enjoy with the mountain backdrop in the background.
- The Community Ditch Trail and the Doudy Draw Trail are very popular. Less used are County Road 67 up to the Fowler Trail and a very small trail segment that connects to the Rattlesnake Gulch Trail.
- Visitor use--people, dogs, horses, and bikes--is moderate and has increased steadily, fueled by its "discovery" by many visitors, many of whom live in the growing cities outside Boulder County. Off-trail use especially has been expanding. An extensive network of undesignated trails, primarily along and north of the Community Ditch Trail and south of the Doudy Draw Trail (east-west portion), dissects this area.
- Dog management on the Community Ditch Trail and the Doudy Draw Trail is on-leash or voice-and-sight control, except for a portion of the Doudy Draw Trail that is seasonally on-leash because of bear protections (no change). On County Road 67 up to the Fowler Trail and the trail segment that connects to the Rattlesnake Gulch Trail, dogs are now required to be on trail and on-leash. Dogs are prohibited in the southwest portion of this management area (no change).
- Cultural resources in this management area may need protection or stabilization.

Management Issues

- Undesignated trails are beginning to form in the southern part of Lindsay and Lindsay-Jefferson County, with uncontrolled use on the Stengel II property spilling over into this area. Multiplying undesignated trails are dissecting interior forest habitat, shrubland, and riparian communities. Soil erosion on hillsides and in drainages is occurring where equestrians and pedestrians use them. Weeds are spreading along the undesignated trails, and one social trail threatens an occurrence of Ute ladies' tresses. The quality of habitats is being degraded with uncontrolled access and off-trail use. Of particular concern is the impact of off-trail use on the Doudy Draw wetlands and riparian areas and the north-facing shrublands. The lack of a sustainable trail system where extensive undesignated trails have occurred supports continuation of this situation.
- Significant congestion at the Doudy Draw and Flatirons Vista trailheads, including parking overflow onto Eldorado Springs Drive and State Highway 93 right-of-way respectively, needs to be addressed. Horse trailer parking is common and increases congestion.

Recommended Management Actions

- Develop new designated trails south of the Doudy Draw Trail; eliminate the undesignated trails.
- Develop a new north-south trail connection east of the Denver Water Canal; eliminate the undesignated trails.
- Require dogs to be on-leash (and on-trail), including the existing trails on County Road 67 up to the Fowler Trail and the trail segment that connects to the Rattlesnake Gulch Trail.
- Develop a solution to lessen congestion and parking overflow at the Flatirons Vista trailhead and the Doudy Draw trailhead.
- Closely monitor this area to ensure that any undue impacts do not occur as a result of visitor use.
- Develop and implement a restoration plan for this area to ensure that the health of the ecosystem is restored.

East Marshall Mesa Natural Area

References: 4, 13, 14

Natural Resources

- This management area includes both drier upland grasses (mostly Western wheat-mixed grass prairie) and shrubs and also relatively wet meadows. Diverse riparian areas are present in the Cowdry drainage and along the ditches, and wetlands exist in low-lying areas.
- While this management area was severely disturbed by mining activity in the 19th and 20th centuries, many native plant communities have recovered to varying degrees.
- Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.

Recreational Use

- This management area does not contain any designated trails, but it is becoming more popular as visitors explore off-trail areas to the east of the trailed areas. A substantial network of undesignated trails has developed here. Clearly there is a desire by visitors to travel to and from Superior and connect with existing trails on Marshall Mesa.
- A new trail connection east to Superior is planned, extending from the existing trailhead east to S. 66th St. and then east to Superior.
- Dog management is on-leash or voice-and-sight control (no change).

Management Issues

- Undesignated trails along steep slopes have caused erosion. One of the undesignated trails intrudes into the Cowdry drainage, which could negatively impact the wetland.

- Trailhead parking congestion that spills onto Marshall Drive could become worse with increases in visitation due to general growth in use and the new trail connection.

Recommended Management Actions

- Construct a trail connection from Marshall Mesa to S. 66th St. to Superior; eliminate the undesignated trails.
- Provide a solution to the trailhead parking congestion and safety concerns before the new trail is constructed.

South Boulder Creek Natural Area

References: 2, 3, 4, 6, 9, 13, 14, 17, 35

Natural Resources

- This management area extends along South Boulder Creek from the Centennial Trail south to State Highway 93. It is entirely included in the South Boulder Creek State Natural Area, a State designation that recognizes the high natural values of this relatively large habitat area composed of large remnant stands of tallgrass prairie, wet meadows, wetlands, and plains riparian and transitional riparian forests. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.
- Most of the management area consists of native vegetation, with a preponderance of big bluestem, yellow Indiangrass, western wheatgrass, and prairie cordgrass. Dwarf leadplant and American groundnut (*Apios americana*), both of which are listed as rare and sensitive by the Colorado Natural Heritage Program, are present in this management area. American groundnut in this management area is one occurrence of the six known locations in Colorado (four of six in Colorado are on Open Space and Mountain Parks).
- Two federally-listed threatened species are present--Ute ladies'-tresses and Preble's meadow jumping mouse. The riparian corridors along South Boulder Creek and several ditches provide important wildlife habitat.
- The mixed and tall grasses provide high-quality ground-nesting bird habitat for a suite of grassland bird species not common elsewhere in the Front Range. Voluntary seasonal closures currently are used to protect bobolinks nesting in selected areas.

Recreational Use

- The South Boulder Creek Trail is one of the most heavily used trails in the Open Space and Mountain Parks system. It provides views, shade and amenities in the riparian areas, and access to water. A separate hard surface trail is open to bicycles and horses from Baseline Road to the vicinity of the East Boulder Recreation Center. Some visitors go off-trail to hike close to or fish in South Boulder Creek.
- Dogs are prohibited in the portion of the management area south of South Boulder Road, including the South Boulder Creek Trail, except that dogs are now allowed to travel on-leash from the trailhead parking to where the trail turns north. North of South Boulder Road, dog management is on-leash or voice-and-sight control, except that dogs are required to be on-leash on the multi-use paved trail.
- A significant amount of equestrian and hiking activity is accessed from the Wildflower Ranch (east of South Boulder Creek) and is increasing over time.

Management Issues

- While undesignated trails are not common, undesignated trails along South Boulder Creek exist and trail widening occurs. The South Boulder Creek Area Management Plan sets the objective to minimize the existence of trails on both sides of the same creek sections, in order to preserve habitat values. To date, significant damage to riparian areas has not occurred, but this situation needs to be monitored over time.

- In certain areas, the grassland bird communities may need some protection from dogs during times of nesting (seasonal closures).
- Significant congestion and parking overflow occurs at the Bobolink trailhead. Parking along Marshall Road (just east of Highway 93) is increasing as visitors access the South Boulder Creek management area from the west.

Recommended Management Actions

- Continue the prohibition of dogs south of South Boulder Road (including the South Boulder Creek Trail), in order to provide a place where non-dog walkers can be away from dogs and provide added resource protection.
- To eliminate conflict between dogs and bikes, require dogs to be on-leash on the multi-use paved trail north of South Boulder Road.
- Require seasonal closures or dog exclusions to protect seasonal nesting of grassland birds (a voluntary closure is already in place for this purpose in many areas).
- Develop a solution to lessen congestion and parking overflow at the Bobolink trailhead.
- Separate cattle and trail users, particularly during calving periods.

East Boulder Natural Area

References: 7, 9, 13, 14, 35

Natural Resources

- This management area includes several non-contiguous properties east and northeast of Baseline Reservoir. They include native lowland mesic tallgrass (big bluestem, yellow Indiangrass) and non-native hay pasture grasses (smooth brome, meadow fescue) and alfalfa. The management area also includes some wet meadows and riparian wetlands and forest. Many of these properties are grazed and hayed. Several of the properties have active prairie dog colonies.
- The Steinbach property contains mixed grass prairie habitat with remnant patches of needle-and-thread grass and a designated Prairie Dog Habitat Conservation Area.
- The grasslands provide ground-nesting bird habitat, and stands of cottonwoods provide perching and feeding habitat for raptors. Wintering bald eagles and other raptors perched in the cottonwoods on the Suitts property in the past, but it is unknown whether they still will as the number of visitors and dogs on the adjacent Dry Creek property (with prairie dogs) continue to increase. A small colony of prairie dogs is located on the Suitts property. The pond on the Suitts property provides relatively undisturbed habitat for water birds and other species.

Recreational Use

- The properties in this management area have low levels of visitor use, except for two. The O'Connor-Hagman and Steinbach properties see a high level of use (but low level of patrol). These two properties are directly adjacent to city of Louisville and county residents who use them for hiking and dog walking on undesignated trails (there are no designated trails).
- Dog management is on-leash or voice-and-sight control (no change except for proposal to use seasonal closures or dog exclusions to protect seasonal nesting of grassland birds).

Management Issues

- In certain areas, the grassland bird communities may need some protection from dogs during times of nesting (seasonal closures).
- The off-trail use on the O'Connor-Hagman and Steinbach properties may be causing damage to the grasslands and introducing weeds.

Recommended Management Actions

- Require seasonal closures or dog exclusions to protect seasonal nesting of grassland birds.
- Develop a trail system to formalize visitor use on the O'Connor-Hagman and Steinbach properties.
- Determine whether or not the fishing that currently occurs on the Suitts Pond should be designated or prohibited.

Creek Confluence Natural Area

References: 4, 9, 11, 13, 14, 35

Natural Resources

- This management area consists of two non-contiguous areas that contain or are in proximity to water bodies. While these areas have experienced significant human use and disturbance in the past, they are in various stages of recovery and are diverse in habitat quality.
- The Boulder Creek-South Boulder Creek confluence area includes floodplain and riparian wetland habitats and still creek backwaters and ponds that are valuable to many birds, mammals, and amphibians. The Short-Milne property, near the confluence of Boulder Creek and Fourmile Creek, contains an occurrence of Ute ladies' tresses, a federally threatened species. The management area also includes several prairie dog colonies (much of Andrus Mesa is a Prairie Dog Habitat Conservation Area). The extensive riparian forest and wetland areas in the Creek Confluence Natural Area are identified as important stream connections between Environmental Conservation Areas in the Boulder County Comprehensive Plan.
- Sawhill Ponds, created by sand and gravel mining/reclamation of the Boulder Creek floodplain and fed by water from Boulder Creek and groundwater, provides a unique plains marsh environment that supports a wide variety of insects, birds, mammals, fish, and amphibians. Some extensive cottonwood riparian areas are present in the upland areas, which provide habitat for owls and many other birds.

Recreational Use

- The level of visitor use on these properties varies greatly. The Creek Confluence management area receives a high level of visitation on the Boulder Creek and South Boulder Creek bikepaths, while off-trail use (including fishing) is low but increasing. A new trail connection through this area from the Boulder Creek path to Gunbarrel area trails is planned. Dogs are required to be on-leash on parts of the South Boulder Creek Trail and at KOA Lake (no change).
- Sawhill Ponds receives a high level of use by hikers, picnickers, dog walkers, birders, fisherpersons, and others. Many undesignated trails exist there. Dogs are required to be on-leash at Sawhill Ponds except for Ponds 1 and 2 (no change).

Management Issues

- New trails in the Confluence Area must minimize visitor use impacts on sensitive resources.
- Pit D provides valuable habitat that should be protected by not allowing dogs.
- The concentration and diversity of visitor activities at Sawhill Ponds, and the need for improved trails there, suggest the need for a site management plan.
- Open Space and Mountain Parks would like to own Sawhill Ponds, which it currently leases from the Colorado Division of Wildlife.

Recommended Management Actions

- Close Pit D to dogs.
- Construct the Valmont to Gunbarrel trail connection, with the alignment designed to minimize impacts on resources.
- Formalize the trails to the first two ponds (most easterly ones) at Sawhill Ponds.

(Both the Valmont to Gunbarrel trail connection and trail improvements at Sawhill Ponds will be considered for action as part of the Boulder Creek Confluence Plan, which is currently underway.)

Valmont Reservoir Natural Area

References: 7, 9, 13, 14

Natural Resources

- This management area includes two non-contiguous areas that are close to Valmont Reservoir: Valmont Butte open space and Ute Industrial Park properties.
- Valmont Butte open space includes the north side of the Butte and is relatively undisturbed. It includes some remnant native grassland and shrublands. It provides habitat for birds and mammals in a relatively isolated, protected setting.
- The larger Valmont Butte geologic site has a long history of human activities and alteration. It was part of the original Valmont Butte town site. It was historically mined for crushed rock and gravel as late as the 1980s. It was the location for a historic mining ore processing site, with tungsten, gold, and silver brought there from elsewhere. It is the location of the historic Valmont cemetery. It has been used as a Native American ceremonial site. The Valmont site is proposed for city of Boulder redevelopment, including a biosolids composting/recycling site and a regional fire training facility.
- The Ute Industrial Park property is surrounded by Valmont Lakes on two sides and provides both prairie and riparian habitat that support an extensive prairie dog colony, raptors, badgers, and many other animals. An osprey nest is currently located there. Most of this property was converted to agricultural crops and hay fields decades ago, and the condition of its vegetation and soils currently is very poor. The property is designated as a Prairie Dog Habitat Conservation Area. The Open Space and Mountain Parks operations/maintenance office occupies a former industrial building there.

Recreational Use

- Valmont Butte has very low visitation and has no visitor facilities.
- The Ute Industrial Park property receives a low level of visitation but could be a popular wildlife watching destination (for birds and prairie dogs).
- Dog management is on-leash or voice-and-sight control in this management area (no change).

Management Issues

- Redevelopment of Valmont Butte must protect the open space habitat values, deal with containment/clean-up of mine tailings, and respect the historic structures and cemetery.
- Significant growth in birding or other visitor activities may require management of visitor use at the Ute Industrial Park property.

Recommended Management Actions

- Ensure that the redevelopment of Valmont Butte protects the open space habitat values and cultural values of the property.
- If significant growth in wildlife observation or other visitor activities occurs, consider providing wildlife viewing and interpretive facilities.

Diagonal Natural Area

References: 7, 8, 9, 13, 35

Natural Resources

- This management area includes four non-contiguous areas close to and providing open land buffers along the Boulder-Longmont Diagonal Highway. Fourmile Canyon Creek is a

prominent natural feature, with some extensive cottonwood stands and other riparian habitat. Some drainageway wetlands and wet meadows are present. The vegetation is a mosaic of various types, dominated by non-native hayfields that offer ground-nesting bird habitat.
- Extensive prairie dog colonies exist on many portions of the management area (the part of the management area north of Independence Road and east of the Boulder-Longmont Diagonal Highway is a Prairie Dog Habitat Conservation Area).

Recreational Use
- The Fourmile Canyon Creek Trail and the Cottonwood Trail receive a high amount of visitation. However, the rest of the management area receives relatively low levels of visitor activity, and few undesignated trails exist.
- Dog management is on-leash or voice-and-sight control in this management area (no change).
- A key trail connection between the Fourmile and Cottonwood trails, involving a crossing of the Burlington Northern railroad tracks, is proposed.

Management Issues
- Visitors routinely cross from the Fourmile and Cottonwood trails, going over the railroad tracks or through sensitive riparian areas. A new safe, sustainable trail crossing is needed.
- Dogs roam off-leash in both prairie dog and riparian areas. The designated trails in this area criss-cross through a prairie dog colony where very few users control their dogs.
- In certain areas, the grassland bird communities may need protection from dogs during times of nesting (seasonal closures).

Recommended Management Actions
- Require seasonal closures or dog exclusions to protect seasonal nesting of grassland birds.
- Construct a safe trail crossing from the Fourmile Canyon Creek Trail to the Cottonwood Trail.

Gunbarrel/Heatherwood Natural Area

References: 4, 7, 13, 14, 35

Note: The Open Space and Mountain Parks lands in the Gunbarrel area have been placed into two management area designations: the Gunbarrel/Heatherwood Passive Recreation Area (south of Lookout Road, described in a separate section) and the Gunbarrel/Heatherwood Natural Area (north of Lookout Road, described in this section). These two management areas share many characteristics, with much of the land in dryland farming. However, the bulk of the passive recreational activity occurs in the Passive Recreation Area.

Natural Resources
- In the past, the land on Gunbarrel Hill and around Heatherwood (a large contiguous block of land) was farmed for dryland crops (mostly dryland winter wheat), and much of it was severely overgrazed. These damaged lands are now undergoing native grassland restoration under the federal Conservation Reserve Program. The soils on these dry wind-exposed sites did not support plowing and cropping in a sustainable manner, with the result that they became highly eroded. The restoration of these lands has involved the planting of native grasses and forbs. The different properties are in different stages of recovery, but they are all being managed to restore a sustainable native grassland ecosystem. The habitat values of these lands are slowly being restored with the natural stabilization of prairie soils and reestablishment of native plant communities.
- Other smaller blocks of non-Conservation Reserve Program properties are still cultivated with non-native hay crops, some are non-native pastures used for grazing, and some are fallow. The habitat values of grassland properties in this management area support many native bird species, as well as small mammals, including some prairie dog colonies. The prairie dog colony in this management area has been the location of nesting burrowing owls, the first

observed or recorded nesting success in the Boulder Valley in years. The management area also supports some wet meadows and wetlands along ditches and creeks. Located in the White Rocks/Gunbarrel Hill Environmental Conservation Area.

Recreational Use

- Much of the land in this management area does not receive a high level of visitation. However, the Cottontail Trail, which is next to residential areas, receives significant visitation (hiking, dog walking, and biking).
- Dog management in this management area is predominately on-leash or voice-and-sight control (no change). Dogs on-leash is required on two portions of the Cottontail Trail (no change).

Management Issues

- Off-trail activities such as hiking and dog walking, to the extent that it occurs in the future, may make it more difficult to prevent invasion of weeds and restore some of the Conservation Reserve Program lands.
- In certain areas, the grassland bird communities may need some protection from dogs during times of nesting (seasonal closures).

Recommended Management Actions

- Monitor, assess, and determine whether or not any restrictions on visitor access should be implemented to support the restoration of native grasslands on the Conservation Reserve Program lands.
- Require seasonal closures or dog exclusions to protect seasonal nesting of grassland birds.

Outlots

References: 13

Natural Resources

- There are dozens of small outlots that have been dedicated as open space. They vary in their character and size. Some are internal open space in housing or industrial developments, some are undeveloped, some are natural portions of large residential lots next to larger Open Space and Mountain Parks land holdings, some are along Greenway trails. Some outlots have high quality habitat values (such as the east side of the Dakota Hogback or certain wetlands/riparian areas), while others do not, but they all provide relief from dense urban development. Size is highly variable--from less than 1/10th of an acre to 20+ acres.

Recreational Use

- The recreational use of these properties varies depending on whether they are privately owned with an open space easement or publicly owned, their location relative to development, and their size.
- Dog management is generally on-leash, since most of these properties are in the city (no change).

Management Issues

- These relatively small parcels are difficult to manage for recreational use and for conservation of natural resources.

Recommended Management Actions

- No specific recommendations.

Agricultural Areas

East Boulder Valley Agricultural Area

References: 9, 13, 35

Natural Resources

- The two designated Agricultural Areas include the largest blocks of high quality, productive agricultural land in the Open Space and Mountain Parks system. These areas were once native grasslands but have been converted to agricultural production because of their excellent soils and water availability to support crops (such as corn, wheat, oats, barley, or alfalfa, smooth brome and orchard grass hay) and/or non-native grasslands for grazing.
- American groundnut (*Apios americana*), which is listed as rare and sensitive by the Colorado Natural Heritage Program, is present in the East Boulder Valley Agricultural Area. American groundnut in this management area is one occurrence of the six known locations in Colorado (four of six in Colorado are on Open Space and Mountain Parks).
- This management area includes a number of physically disjunct agricultural properties in the eastern part of the Boulder Valley. Dry Creek runs through several of these properties, and several ditches provide water for irrigation (most are irrigated). Some wet meadows and riparian areas are present.
- In some fields limited herbicides or pesticides are used to maintain crop production. Heavy machinery is used in agricultural production in some fields.

Recreational Use

- Hiking, dog walking, horseback riding, and bike riding are popular activities on the East Boulder-Teller Farm Trail.
- Dog management is on-leash or voice-and-sight control in this management area, except for on-leash at Teller Lake #2 and no dogs at Teller Lake #5 (no change).
- Fishing is a popular activity at Teller Lake # 2 and Teller Lake # 5.
- A major new trail connection is planned for the East Boulder Trail from the Dry Creek property (at Baseline) to Teller Farm, located on Open Space and Mountain Parks properties and paralleling Dry Creek in some places.

Management Issues

- Crops and hay are damaged when people, dogs, and horses travel off-trail.
- Dogs roam off-leash in both prairie dog and riparian areas. The designated trails in this area criss-cross through a prairie dog colony where very few users control their dogs.
- In order to protect resources, the trail alignment for the East Boulder Trail extension should be located to minimize disruption to the riparian zone for Dry Creek and agricultural operations.

Recommended Management Actions

- Monitor compliance with dog regulations in this management area and take management actions to minimize conflicts with agricultural operations.
- Future construction of the East Boulder Trail from Dry Creek to Teller Farm should be located to minimize impacts on the Dry Creek riparian zone and agricultural lands.

North Boulder Valley Agricultural Area

References: 4, 7, 8, 13, 14

Natural Resources

- Boulder Valley Ranch is a working ranch with horse boarding, cattle grazing, and hay production. It includes some remnants of mixed-grass prairie (western wheatgrass-blue grama), but most of this agricultural area is non-native hay grass fields, many of which are

irrigated. A small portion of the area is shale barren prairie with needle-and-thread grass and New Mexican feathergrass, both listed by the Colorado Natural Heritage Program. The management area supports a large and significant occurrence of Bell's twinpod, also listed by the Colorado Natural Heritage Program. The management area also includes some riparian areas, wetlands, and pond/marsh habitat. Located in the Boulder Valley Ranch/Beech Open Space Environmental Conservation Area.

- The management area includes some extensive prairie dog colonies (much of the management area is included in a designated Prairie Dog Habitat Conservation Area). It also includes perches and feeding areas for raptors (including bald eagles), and nest sites for northern harriers.
- The native grasslands and some of the irrigated hay fields are habitat for ground nesting birds.

Recreational Use

- The Boulder Valley Ranch trails are heavily used, especially since they provide a connection between foothills trails and trails around Boulder Reservoir. The Sage Trail and the Eagle Trail in this management area are very popular with hikers, bicyclists, dog walkers, and horseback riders. Others parts of the management area on the northern and eastern fringes do not have trails but do get some off-trail use.
- Dogs are currently prohibited in a significant portion of this management area (Axelson property, no change). The Sage Trail is now on-corridor voice-and-sight control.
- A new trail from Boulder Reservoir to Lyons along the Boulder Feeder Canal is proposed as a collaborative project with Boulder County. Concerns about possible negative water quality impacts from a new trail have been expressed by the Boulder Water Utility, and a resolution of conflicting views will be needed before this trail becomes possible.

Management Issues

- A significant conflict exists between off-leash dogs and livestock, and to some extent off-trail visitor use and crop production. The problem of dogs harassing cattle is especially acute during the calving season.
- Dogs chasing prairie dogs off-trail is also a significant problem.
- Trail widening, braiding, and associated soil erosion and spread of weeds are significant problems in this management area.
- Bell's twinpod habitat needs to be protected from trampling by off-trail visitors.

Recommended Management Actions

- Implement seasonal on-leash requirements, where needed, to reduce dogs harassing cattle.
- The Sage Trail is proposed for a voice-and-sight compliance study area, which will evaluate whether or not changes to dog management regulations are needed.
- Make improvements to the existing fence along the Eagle Trail where dog off-trail travel is prohibited.
- Maintain dog access to most of the former irrigation/stock pond.
- Make trail improvements to deal with problems of trail widening, braiding, and erosion, including definition of the tread for major trails.
- Close the undesignated trails in the area just south of the Sage Trailhead, with its concentration of Bell's twinpod.
- Construct the Boulder Feeder Canal trail portion on Open Space and Mountain Parks lands when issues have been resolved.

Habitat Conservation Areas

North Foothills Habitat Conservation Area

References: 1, 4, 7, 8, 10, 13, 14, 15, 16, 31, 34

Natural Resources

- A large, relatively unfragmented habitat block, including a mosaic of mixed grass prairie, woodlands, shrublands, and riparian habitats. Includes a variety of steep draws and flatter mesas. The management area includes many Colorado Natural Heritage Program-identified sensitive plant communities, including: Foothills ponderosa pine savanna, Foothills ponderosa pine scrub woodland, Great Plains mixed grass prairie, mixed foothills shrubland, shortgrass prairie, and xeric tallgrass prairie. Includes important shale barren outcrops of the Niobrara and Pierre shale formations. Includes extensive prairie dog habitat (part of the management area is included in a designated Prairie Dog Habitat Conservation Area), rare butterfly habitat, and rare plants such as Bell's twinpod and birdsfoot violet. Some of the rare butterflies that depend on this area include: cross-line skipper, arogos skipper, and two-spotted skipper. The management area is important habitat for ground-nesting birds, because it offers a large block of high quality grassland habitats.
- This management area is a major raptor use area along the foothills. Historically and to this day, eagles nest on the Palisades, a striking vertical cliff-face, which is included in the seasonal wildlife closures.
- Includes the only known rattlesnake hibernaculum on Open Space and Mountain Parks lands, and many other kinds of snakes are concentrated here. The hibernaculum site is probably near the crest of the foothills in the Schneider draw; snakes likely disperse to lower elevations during the summer. Protection of this habitat for reptiles is critical to allow reproduction.
- Includes rare red-lipped plateau lizards.
- This management area has very good restoration potential as an ecotonal foothills grassland/mixed grassland ecosystem. Located in the Boulder Valley Ranch/Beech Open Space Environmental Conservation Area.

Recreational Use

- Currently there are two designated trails (Hogback Trail and a section of the Foothills Trail) and a low density of undesignated trails. A historic railroad grade running along the foothills has become the major undesignated recreational access and trail into the north part of the management area. Recreational use is currently relatively low but has been increasing. Visitor use is projected to grow substantially as all the new north Boulder neighborhoods are developed. There is a desire by recreationists to extend the Foothills Trail north from its terminus to the Heil Ranch.
- Dogs are required to be on-leash in this management area (no change). They are not allowed on the Hogback Trail (no change). They are required to be on-leash or voice-and-sight control on the Foothills Trail located on the south boundary of this management area.
- Contains prehistoric and settlement-era cultural resources. These resources need protection from visitor use activities.

Management Issues

- Undesignated trails, if they continue to develop, will significantly degrade and fragment the habitat. Some of the natural features and resources would be highly sensitive to damage from off-trail use.
- The steep draws, rocky hillsides, and shale barrens have highly erodable soils that are not suitable to sustainable trail construction and use.
- No infrastructure is currently provided to accommodate the paragliding activity. This activity may not be sustainable without new infrastructure to support it.

Recommended Management Actions

- Eliminate undesignated trails in the West Beech and Palisades areas.
- Maintain the no-dogs requirement on the Hogback Ridge Trail.
- Assess whether or not to provide a paragliding launch and landing site in this management area.

Western Mountain Parks Habitat Conservation Area

References: 4, 10, 11, 14, 16, 19, 20, 21, 22, 24, 25, 26, 31, 32, 34, 35

Natural Resources

- This management area contains many different types of ecosystems that form a mosaic of different habitat types: rocky cliffs, forests, woodlands, grassland savannas, montane meadows, wetlands, and riparian areas. Located in the Hawkin Gulch/Walker Ranch/Upper Eldorado Canyon Environmental Conservation Area and Boulder Mountain Park/South Boulder Environmental Conservation Area. Most of this management area is registered in the Colorado Natural Areas Program. Once the Visitor Master Plan is completed, the Natural Areas Program designation will be finalized.
- Contains several large habitat blocks, which are dissected by few if any trails and roads. These habitat blocks contain most of the naturally occurring ecosystem components and processes and harbor many species that thrive where few people are present (e.g., forest interior species).
- Contains many diverse forest settings and rich habitats--wet and dry areas, higher and lower elevation, diversity of tree species and ground-level vegetation.
- Contains the upper reaches of many important riparian areas and ephemeral streams and many biological diversity hot spots for rare and sensitive plant communities, where many different kinds of species occur in concentrated areas or corridors, including many listed by the Colorado Natural Heritage Program. Some of the many rare and sensitive plants include: chaffweed, paper birch, white adder's mouth, Sprengle's sedge, Torrey sedge, rattlesnake fern, Rocky Mountain sedge, smilax, Frost weed, yellow hawthorn, wood lily, broad-leaved twayblade, wavy-leaf stickleaf, western polypody, calypso orchid, picture-leaf wintergreen, and hazelnut, river birch and alder communities.
- This management area contains many areas with avian habitats of special interest, which harbor birds such as wild turkey, hermit thrush, ruby-crowned kinglet, hairy woodpecker, flammulated owl, long-eared owl, pygmy owl, saw-whet owl, northern goshawk, sharp-shinned hawk, and golden eagle.
- Provides a refuge for large forest predators like black bears and mountain lions.
- The Green Mountain area is a site for several rare butterflies, including: hop-feeding azure, Schryver's elfin, and Snow's skipper.
- Contains important habitat for the state-threatened Townsend's big-eared bat and many other bats.
- Contains several important areas of special natural heritage values:

Lost Gulch and Long Canyon/Panther Bowl

- Contains many rugged areas that have never been logged and some of the oldest trees on Open Space and Mountain Parks (300-400 years old).
- Several moist drainages (which are spring fed), with important riparian areas that harbor many rare, sensitive, and threatened plant communities (such as wild sarsaparilla, black snakeroot, carrionflower, wood lily, paper birch, beaked hazelnut, red baneberry, Rocky Mountain sedge, Torrey sedge, and broad-leafed twayblade orchids). These areas are hotspots for forest breeding birds.

Greenman Springs

- Particularly important botanical hot spot that contains the only known occurrence of the White adder's mouth orchid in Colorado, as well as other rare and sensitive plant species such as rattlesnake fern and western polypody fern.

Bear Canyon and High Elevation Areas

- Bear Canyon is an important wildlife travel corridor from the foothills to the plains.
- There are many unique and diverse forest settings in areas behind Bear Peak and South Boulder Peak, including mixed conifer stands that contain lodgepole pine, limber pine and Colorado blue spruce, and alder and birch communities.
- The federally listed Preble's meadow jumping mouse (threatened) inhabits Upper Bear Canyon.

Recreational Use

- This management area is a destination for those who want to climb the highest mountain peaks in Boulder's mountain backdrop, including Green Mountain, Bear Peak, and South Boulder Peak.
- Provides both moderate and rugged back-country experiences. A destination for those seeking physical challenge, remoteness, and solitude. Many trails wind through thick forest or travel to the high peaks.
- The overall level of trail use is low, and there is a low density of undesignated trails.
- Climbing and bouldering occur in this more remote management area, but they are not as popular here as in the Flatirons/Mountain Backdrop Natural Area. Sacred Cliffs and the backside of South Boulder Peak are two of the most popular climbing destinations in this management area. Access to them requires going off the designated trails.
- Mountain biking groups have advocated either opening some mountain backdrop trails to bikes or building a trail connection west of State Highway 93 through the mountain backdrop to Walker Ranch or Boulder Canyon. Currently there is a Council-adopted prohibition on new mountain biking trails west of State Highway 93/Broadway.
- Dog management in this management area has historically been all voice-and-sight control; the Visitor Master Plan changes dog management to be predominantly on-leash, with some exceptions**:** no dogs on Long Canyon Trail and on a portion of the E.M. Greenman Trail, and on-corridor voice-and-sight control on Ranger Trail to Green Mountain peak. Dogs are currently required to be on-leash on the Boulder Creek Bike Path and the Eldorado Canyon Trail (no change).

Management Issues

- Considerable spillover of hiking use occurs from the Flagstaff Road corridor into untrailed areas, particularly off-trail use by climbers seeking out climbing rocks or bouldering areas.
- Opportunity to preserve the unique back-country experience **(**especially important here given increases in visitor use).

Lost Gulch

- Relatively intact with few threats from recreational use, and the opportunity is available to secure this area from future threats. A new multi-use trail is proposed on Chapman Drive that would provide a bike link from Boulder Canyon to Flagstaff Road. If this trail were built, visitors should be required to stay on-trail, in order to prevent new undesignated trails that would threaten the rare and sensitive plant communities and forest interior habitat in the vicinity of Lost Gulch.

Long Canyon/Panther Bowl

- The Panther Bowl area is now relatively intact with few threats from recreational use, and the opportunity is available to secure this area from future threats.
- Long Canyon Trail is within or in close proximity to the riparian zone in many places; trampling of rare and sensitive plant communities is a significant threat there, particularly from people and dogs going off-trail to the stream.

Upper Bear Canyon Area

- Visitor use is increasing over time. The designated trail is within and crosses the riparian zone several times (although fewer times since the trail re-routes in 2004); it is in close proximity to rare and sensitive plant communities, which may be damaged by soil erosion or trampling. The density of undesignated trails is not high, but they dissect a large habitat block.
- Increasing and concentrated impacts of visitor use**;** in the area west of Bear Peak and South Boulder Peak, new bouldering areas are creating new undesignated trails; off-trail running events are also adding to undesignated trails. Neighbors on Bison Drive are observing unsanctioned visitor access and use and dogs chasing wildlife.

Recommended Management Actions

- Do not construct any new trails in the Tram Hill/Lost Gulch area.
- Where it is beneficial to provide enhanced protection, for particular trail segments, continue to relocate the Long Canyon Trail up-slope away from the riparian area.
- In Bear Canyon, implement re-routes that reduce the number of stream crossings, riparian impacts, and soil erosion (completed in 2004).
- Require dogs to be on-leash (and on-trail) for: Green Mountain West Ridge Trail, Green-Bear Trail, Bear Canyon Trail, and Bear Peak West Ridge Trail. Institute on-corridor voice-and-sight control on Ranger Trail and the connecting trail between Bear Peak and South Boulder Peak trails. Prohibit dogs on the Long Canyon Trail and a portion of the E.M. Greenman Trail.
- Work with the Access Fund, the Flatirons Climbing Council, and other community groups to develop a sustainable climbing access trail to the Sacred Cliffs.
- Consider a possible mountain bike (multi-use) trail corridor from the frontside to the backside of Mountain Parks (i.e., from Eldorado Springs to Walker Ranch).

Eldorado Mountain Habitat Conservation Area

References: 4, 10, 13, 14, 16, 23, 26, 28, 29, 31, 32

Natural Resources

- A remote large habitat block with a very diverse mosaic of cliff, forest, woodland, shrubland, montane forest meadows with xeric tallgrass, and riparian/wetland habitats. Because of the large elevation changes and diversity in habitats, this management area harbors many different kinds of habitats and species. This management area harbors several known rare plants (listed by the Colorado Natural Heritage Program) such as birdsfoot violet (*Viola pedatifida*) and dwarf leadplant (*Amorpha nana*). In addition, the area contains a rare plant community listed by Colorado Natural Heritage Program (Ponderosa pine/Big bluestem, mountain mahogany). This occurrence is the most southerly extent of mountain mahogany on Open Space and Mountain Parks lands. Located in the Hawkin Gulch/Walker Ranch/Upper Eldorado Canyon Environmental Conservation Area and Boulder Mountain Park/South Boulder Environmental Conservation Area.
- The management area contains avian habitats of special interest, including cliff nesting raptor habitat, north-facing upland shrublands, and several pockets of forest interior habitat and mature forest. Species of concern like Northern goshawk and flammulated owls, denizens of intact mature forest, inhabit the area.
- There are several drainages that provide riparian habitat that harbor many different species including threatened Preble's meadow jumping mouse. This management area is also a high-

use bear and mountain lion area. The area's montane and foothills meadows offer habitat to many rare and threatened butterfly species identified by the Colorado Natural Heritage Program (some of the same species identified under the Western Mountain Parks Habitat Conservation Area).

- The back-country areas of the Schneider donation, Ebner, Eldorado Mountain, and Lindsay-Jefferson County properties are very remote and have very high habitat quality and ecosystem values.

Recreational Use

- This management area, because of high habitat quality, low visitor use, and remote location, offers both a refuge for animals and a potential back-country experience for visitors. There are no designated trails into the area. Dogs historically have been prohibited in most of this management area.
- There are undesignated trails used by climbers traveling to the Mickey Mouse Wall, several of which cross private property or the railroad right-of-way. These undesignated trails include: the road to the former Conda quarry from Eldorado Springs Drive; the existing railroad right-of-way on the mountain; and spurs off the Rattlesnake and Fowler trails in Eldorado State Park. This climbing area is accessible only part of the year and is not yet heavily used. Mickey Mouse Wall has a raptor closure from February 1 to July 31.

Management Issues

- This management area, except for the mine face scar (which has been reclaimed), is relatively unspoiled and lightly used. The opportunity exists to preserve the high habitat quality by emphasizing resource conservation and limiting visitor use. If a trail or trails were developed in the area, they could be limited, located to minimize impacts, and require on-trail visitor use.
- The undesignated trails leading to the Mickey Mouse Wall climbing area are causing significant habitat fragmentation, erosion, and vegetation loss. Currently no legal access exists to the Mickey Mouse Wall.

Recommended Management Actions

- Do not develop any new trails west of the Denver Water Canal.
- Work with the Access Fund, the Flatirons Climbing Council, other community groups, and the private property owner to develop / designated a sustainable climbing access trail to the Mickey Mouse Wall (may require acquisition or trail easement) and the Peanuts Wall.
- Evaluate, close, restore, and monitor existing undesignated trails.

Jewel Mountain Habitat Conservation Area

References: 6, 7, 13, 15

Natural Resources

- This management area is a relatively intact large habitat block with a very high quality tallgrass prairie (with species like big bluestem, little bluestem, yellow Indiangrass, switchgrass, needle-and-thread grass, western wheatgrass, and others) and Coal Creek running through it. The tallgrass occurs because the Rocky Flats piedmont floodplain deposit, which is one of the oldest geologic surfaces in Colorado, holds enough water close to the surface to support xeric tallgrass. The tallgrass has persisted because the rocky nature of the soils prevented plowing and conversion to other non-native grasses. This management area is part of the Rocky Flats Bluestem community type, which is likely part of the largest xeric tallgrass remnant in North America. The Colorado Natural Heritage Program believes the Rocky Flats Mesa xeric tallgrass to be the largest remnant in Colorado. The xeric tallgrass communities provide habitat for many rare butterflies.
- Some significant stretches of Coal Creek run through the management area, and it is an exceptional high-quality, un-trailed riparian corridor, used for wildlife migration from the foothills

to the plains. There are also some high-quality upland shrub communities. Both of these habitat types provide nesting, feeding, and hiding cover for birds and mammals. The federally-threatened Preble's meadow jumping mouse is present here. A prairie dog colony is present on the Van Vleet-Jefferson County property.

- Jewel Mountain Lake, a natural water body, is buffered by a fairly intact grassland community. It has a diverse aquatic life and provides habitat for shorebirds. It has the largest documented population of painted turtles on Open Space and Mountain Parks.
- This management area, along with the adjacent Jefferson County Open Space property, provides forest and grassland winter habitat for elk.

Recreational Use

- This management area currently is "unofficially closed" to public use, and there are no designated trails. Although visitors use the access road along the Denver Water Board Canal, the amount of visitor use is very low in this management area.
- A major highway on the eastern boundary (State Highway 93) and the Plainview residential subdivision in Jefferson County bound the management area. Gravel mining still occurs to the north of this property. The Ranson-Edwards Jefferson County Open Space property lies adjacent to the south and west of Jewel Mountain and includes a portion of the Coal Creek corridor.
- There may be a Jefferson County Open Space proposal to build a trail on the Jefferson County Ranson-Edwards property on the west side of their property. There is a proposal for the Front Range Trail to run generally along State Highway 93 (which could be on the west or east side), but it could run through Jewel Mountain/Van Vleet-Jefferson County properties.

Management Issues

- Since this management area contains such a high quality grassland and riparian corridor, and very little visitor use occurs there now, the opportunity is there to protect and preserve this unique ecosystem by minimizing future visitor use impacts.
- The Jewel Mountain/Van Vleet-Jefferson County properties are the location of some important cultural resources. Open Space and Mountain Parks has a joint management agreement with the United Tribes of Colorado, which requires protection of the cultural resources and would require joint agreement on the construction of a trail on these properties.
- Grazing management in this management area is in the process of being evaluated, with the intent to reduce grazing intensity.

Recommended Management Actions

- Do not develop any new trails and formally close the management area to public access.
- Hold open the possibility of future sustainable trail development at the periphery of the habitat block, potentially coordinating with Jefferson County.
- Ensure that the Front Range Trail does not dissect this high quality habitat.
- Modify grazing practices in this management area to implement vegetation management prescriptions.

Southern Grasslands Habitat Conservation Area

References: 2, 3, 4, 6, 7, 13, 14, 17

Natural Resources

- This management area is the largest relatively intact block of grassland habitat in the Open Space and Mountain Parks system (a mosaic of plains riparian, mixed grass, and tallgrass habitats). It is a mixed complex of many different kinds of prairie grassland communities. The dominant shortgrass species include buffalograss and blue grama. Some of the important tallgrasses include big bluestem, little bluestem, switchgrass, needle-and-thread grass, prairie dropseed, side-oats grama, western wheatgrass, junegrass, and purple three-awn. It also

includes some rare forb and shrub communities. Dwarf leadplant (*Amorpha nana*), which is listed as rare and sensitive by the Colorado Natural Heritage Program, is present in this management area. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.

- Much of this management area is open to cattle grazing. It includes important undisturbed prairie dog habitat, which is the largest Prairie Dog Habitat Conservation Area designated on Open Space and Mountain Parks. The grassland is large enough and intact enough to be a site for threatened and endangered species reintroduction (e.g., sharp-tailed grouse and pronghorn). The management area has high quality prairie and mountain vistas. It has good restoration potential as a remnant mixed grass prairie. This area includes active reclamation of historic sand and gravel mining operations.
- This management area contains several miles of Coal Creek, the longest stretch of a riparian area without trails in the Open Space and Mountain Parks system. Coal Creek is a major restoration project for Open Space and Mountain Parks, with the goals of reestablishment of functioning channel morphology and hydrology and restoration of wetland and riparian vegetation. Coal Creek has high habitat value, especially for avian species. A pair of bald eagles attempted to nest along Coal Creek in 2003, 2004, and 2005, and there has been a seasonal wildlife closure to protect the nest. It is habitat for the state-threatened Preble's meadow jumping mouse. The Terra Foundation has provided grant funding to assist the restoration of Coal Creek. The funding is based on a commitment to protect and preserve the creek after restoration work is completed.

Recreational Use

- This management area currently has no designated trails in it and is a low use area. The Greenbelt Plateau Trail forms part of its western boundary and the Coalton Trail part of the eastern boundary. Open Space and Mountain Parks has considered building a trail connector at the southern periphery of the management area (hugging State Highway 128), which would connect the Greenbelt Plateau trailhead to the Coalton Trail on the east. Unfortunately, the original proposed alignment involved partial use of the State Highway 128 right-of-way, but use of the right-of-way was denied by the Colorado Department of Transportation. The proposed trail from the East Marshall Mesa Natural Area to Superior would be located in the northeast portion of this management area--the alignment would follow the south side of Highway 170 (but not close to the Cowdry drainage) to S. 66th St., then south along S. 66th St., stopping short of Coal Creek, and connect to Coal Creek Drive in Superior.
- A recently installed stoplight at the intersection of State Highways 128 and 93 now provides a safe road crossing and connection to the Doudy Draw Trail. Open Space and Mountain Parks had proposed a trail connection using an existing underpass to connect the Greenbelt Plateau trailhead east of State Highway 93 to the Flatirons Vista trailhead west of State Highway 93, but the new pedestrian-activated stoplight with a new short connection to the Doudy Draw Trail will take its place. There are a number of existing/potential undesignated trails in this management area, but currently they do not get high visitor use.
- A launch site for beginning-level hang gliders is located off State Highway 128 on the Waneka property. The area of landing is relatively small.
- Currently, dog management in this management area is predominantly no-dogs, although dogs are allowed on leash or under voice-and-sight control on the Greenbelt Plateau Trail and on leash on the Coalton Trail.
- The Coal Creek corridor (fenced) and the Varra property are both closed to public access because of restoration activities and/or unsafe conditions. In the past, Coal Creek has been a destination for some birders and hikers to a relatively intact, un-trailed riparian area.
- A new trail was built by Boulder County in 2004 that crosses Coal Creek on the Arsenault property and provides a new trail link for Superior residents to the trails in the area.

Management Issues

- Since this management area contains such a high quality grassland and riparian corridor, and very little visitor use occurs there now, the opportunity is there to protect and preserve this unique ecosystem by minimizing future visitor use impacts.
- This large block of grassland ecosystem and the Coal Creek riparian corridor have high habitat values and also high restoration potential. This management area still has relatively low use and is un-trailed. The opportunity exists to keep this large habitat block and riparian corridor intact and free from visitor use that would penetrate the core of this management area. Keeping future visitor use at the periphery of the habitat block would support a high level of habitat effectiveness that derives from the many diverse habitat patches where prairie dogs, raptors, grassland and riparian nesters, grazers, and many other types of wildlife can be sustained.
- The undesignated trails from hikers, equestrians, and hang gliders/paragliders are mostly at the periphery of this large area. Constructing the planned trails at the periphery of the habitat block will channel visitors to low-impact areas and minimize impacts on prairie dogs, soil erosion, vegetation trampling, and weed spread.
- The off-trail landings of the hang gliders, while not deep into the habitat block, have the potential to impede cattle operations and undermine the management of this Habitat Conservation Area.

Recommended Management Actions

- Construct a new trail connection between the Coalton Trail and the Greenbelt Plateau trailhead (at the periphery of the habitat block).
- Continue formal closure of the Coal Creek corridor and the Varra property.
- In order to maximize the extent of the Habitat Conservation Area, prohibit hang gliding and paragliding at the Highway 128 site.

Tallgrass Prairie East Habitat Conservation Area

References: 2, 3, 4, 6, 7, 9, 13, 14, 17, 35

Natural Resources

- A large mixed grassland habitat block, which is split by the Denver-Boulder Turnpike. Most of the management area north of U.S. 36 is in the South Boulder Creek State Natural Area, as is much of the land south of U.S. 36 and west of Cherryvale. The management area also includes several disjunct parcels of the Colorado Tallgrass Prairie State Natural Area. These designations recognize the high natural values of this relatively large habitat area composed of large remnant stands of tall grasses, wet meadows, and riparian wetlands and forests. Located in the Boulder Mountain Park/South Boulder Environmental Conservation Area.
- Most of the management area consists of native vegetation, with a preponderance of big bluestem, yellow Indiangrass, western wheatgrass, and prairie cordgrass. This management area harbors American groundnut (*Apios americana*), which is listed as rare and sensitive by the Colorado Natural Heritage Program. American groundnut in this management area represents two of the known locations in Colorado (four of six in Colorado are on Open Space and Mountain Parks). There are some non-native hay fields, but these areas and others are managed to support their natural values, including habitat for ground-nesting birds (e.g., bobolinks), and the federally-threatened Ute ladies'-tresses and Preble's meadow jumping mouse.
- Several prairie dog colonies are scattered in this management area, and the Gallucci property and part of the Yunker property are in the designated Prairie Dog Habitat Conservation Area.
- The riparian corridors along South Boulder Creek and several ditches provide important wildlife habitat and travel corridors.

Recreational Use

- Currently, the level of visitation in this management area is relatively low. The only designated trail in this area is the connection from the South Boulder Creek trailhead to the trail along South Boulder Road. Off-trail recreational activity occurs mainly in the eastern and southern portions of the management area, with access often originating from residential subdivisions. Off-trail hiking and horseback riding has historically occurred near South Boulder Creek and on Davidson Mesa.
- Dog management in this management area is predominantly no dogs (no change).
- The Church property (east of Cherryvale) is a place where model gliding activity occurs, a very localized seasonal activity that occurs in the irrigated hay meadow when the grass has been hayed and the soil is not too wet. The property is also used for dog training by a number of dog trainers and owners.
- The Louisville Davidson Mesa Trail dead ends into a fence on the east end of the Gallucci property. Some visitors have created undesignated trails on Gallucci by crossing over the fence, and one of these trails leads all the way down to Cherryvale Road.
- A new trail along the U.S. 36 corridor is proposed in the Boulder Valley Comprehensive Plan. Recreationists have proposed a trail connection from Davidson Mesa (both sides of U.S. 36) to Marshall Mesa.

Management Issues

- A proliferation of undesignated trails is occurring in certain parts of this management area, which is exacerbated by the undesirable situation of trails on both sides of South Boulder Creek.
- These multiple trails intensify disturbance from human activity to plants, birds, and other wildlife. Off-trail equestrian use from Wildflower Ranch creates the potential for weed proliferation and other impacts to a wet meadow grassland. The Church, Hogan Brothers, and Damyanovich properties have several undesignated trails, which are becoming an increasing impact to the xeric tallgrass prairie there. The Louisville dead-end trail and access by neighbors has created a system of undesignated trails that are degrading the grassland on Gallucci and elsewhere.
- Existing pedestrian gates currently provide access where it may not be consistent with the Habitat Conservation Area designation.
- In certain areas, the grassland bird communities may need some protection from dogs during times of nesting (seasonal closures).

Recommended Management Actions

- Determine whether all existing pedestrian gates should remain open or not, in order to be consistent with the Habitat Conservation Area designation.
- Change the dog management designation to allow on-leash dogs (currently no-dogs) from the parking lot to Cherryvale/South Boulder Road, which will allow dog walkers to travel from the trailhead to the South Boulder Creek Trail (going north).
- Do not allow the existing off-trail activities for dog training and horseback riding on the Church property.
- Work with the residents of Wildflower Ranch to provide low-impact access to the South Boulder Creek Trail under a special permit.
- Consider a special use permit with appropriate conditions for model glider flying on the Church property (as a long-term historic use that has very few users and is very low impact).
- Coordinate with the city of Louisville Open Space Program to resolve access issues and prevent undesignated access into the Gallucci property and the Prairie Dog Habitat Conservation Area.
- Close the pedestrian gates where off-trail access is no longer allowed.
- Provide signs and other notices that let persons fishing along South Boulder Creek know that they must obtain off-trail permits for fishing along the creek in this management area.

Sombrero Marsh Habitat Conservation Area

References: 9, 12, 13

Natural Resources

- Sombrero Marsh is a unique natural feature in the Boulder Valley, probably the only naturally occurring perennial open water body present in the Boulder Valley at the time of settlement. Sombrero is an alkali marsh, rare in this part of the United States. As a shallow marsh that periodically dries out, Sombrero provides mudflats and deeper water areas, which provide unique habitat for emergent vegetation, wading birds, and other wildlife.
- Open Space and Mountain Parks has invested a great deal of funding and effort to repair the physical extent and functioning of this wetland ecosystem that was present before about 20% of the marsh was filled in with construction and other materials (from 1957-1980).
- Sombrero provides a unique research and educational opportunity to better understand the process of restoring a degraded wetland.

Recreational Use

- Birding has always been popular, as many different kinds of water and wading birds use the marsh.
- The partnership with the Boulder Valley School District and Thorne Ecological Institute provides a unique indoor (i.e., education center) and outdoor educational experience for elementary and secondary students. Research by university students and researchers also occurs at Sombrero Marsh.
- Hiking and dog walking are popular at Sombrero Marsh by neighborhood residents. In the western "environmental preservation area" portion of the property, visitors must stay on the trail or boardwalk, no dogs, bikes or horses are allowed, and visitation is allowed only from dawn to dusk. Seasonal wildlife closures to protect nesting birds occur when warranted.
- In the eastern portion of the property (outside the "environmental preservation area"), dogs are no longer allowed unless a trail is built (where dogs might be allowed with an on-leash on-trail requirement).

Management Issues

- A formal trail connection from the neighborhoods along the south and east is needed to encourage people to stay on-trail in the upland areas, especially the irrigated tallgrass portion of the management area.

Recommended Management Actions

- Develop regulatory changes to support the existing requirement for no off-trail activities in the designated "environmental preservation area" and dogs prohibited.
- Construct a trail connection from the existing trail near the education center to the neighborhoods to the south and east.

Cottonwood Grove Habitat Conservation Area

References: 9, 13, 14

Natural Resources

- The Cottonwood Grove is a remnant concentration of riparian forest along Boulder Creek.

Recreational Use

- The Cottonwood Grove is closed to visitor use because of the rarity and research value of the habitat. An agreement with the University of Colorado has provided long-term research there.
- While closed to public access, the site is used for illegal camping, and there are many undesignated trails.

Management Issues

- Chronic illegal camping and the undesignated trails have the effect of compacting the soils, creating weeds, and eliminating the sparse understory in the grove.

Recommended Management Actions

- Maintain the current visitor access closure in the Cottonwood Grove and continue enforcement against illegal camping there.

Lower Boulder Creek Habitat Conservation Area

References: 1, 4, 7, 13, 14, 15, 18, 32, 33

Natural Resources

- This management area contains many diverse ecosystems and habitats and forms a large habitat block. The backwaters on Boulder Creek are extremely high-quality riparian and wetland/aquatic habitat, important for birds, mammals, and amphibians. The creek channel and its vegetation contain very diverse structure, which enhances the area's habitat diversity and provides a refuge for species that are wary of humans. Located in the White Rocks/Gunbarrel Hill Environmental Conservation Area.
- The lowland areas offer wet meadows, and the upland areas offer mixed grass prairies.
- Prairie dogs inhabit a small part of the management area.
- This management area harbors a large number of amphibian and reptile species, including the only occurrence on Open Space and Mountain Parks land of the six-lined racerunner lizard. Several small ponds are managed as fish refugia.
- The management area provides wintering habitat for bald eagles and nesting habitat for northern harriers. A pair of bald eagles successfully nested near Boulder Creek in this management area in 2003, 2004, and 2005, and a wildlife closure protected the nest.
- Open Space and Mountain Parks has a conservation easement on the White Rocks properties (Windhover Ranch and Ertl), which are sandwiched in the middle of the Open Space and Mountain Parks properties in this management area. White Rocks is designated as a Colorado State Natural Area because of the highly unique rock formations (sandstone cliffs, caves, and terraces, including "turtleback rocks") above Boulder Creek, microhabitats, and rare and threatened ferns and insects that inhabit the area. The Heron Rookery, on the Culver conservation easement located on the east side of 95th St. and adjacent to the Habitat Conservation Area, is on the Colorado Natural Areas Registry.

Recreational Use

- The only designated trail through this management area is the While Rocks Trail, which receives a moderate amount of use from hikers, dog walkers, bicyclists, and horseback riders. No public access is allowed off the trail. A small amount of off-trail visitor use occurs in this management area. To the north are the East Boulder and Gunbarrel Farm Trails and to the south is the Teller Farm Trail--all of which are heavily used.
- Dogs are not allowed in this management area (no change).
- Some of the properties in the Lower Boulder Creek Habitat Conservation Area contain very important cultural resources. These resources need protection and/or stabilization.

Management Issues

- Any increase in undesignated trails is a concern.
- People trespassing in the conservation easements in this management area is a problem.
- An increase in compliance with the no-dog requirement for this management area needs to occur.

Recommended Management Actions

- Maintain the existing no-dog requirement on the White Rocks Trail.
- Maintain efforts to prevent new undesignated trails and to enforce the no-dog regulation in this management area.

References Documenting Characteristics of Management Areas

1. Ashton, K.G. 2000. Reptile survey and identification of critical areas on city of Boulder open space. City of Boulder Open Space Department. Boulder, Colorado.

2. Bennett, B.C., C.E. Bock, and J.H. Bock. 1997. Biodiversity of open space grasslands at a suburban/agricultural interface. Final Report for the Biological Resources Division, U.S. Geological Survey and City of Boulder Open Space Department. Boulder, Colorado.

3. Bock, C.E., J.H. Bock, and B.C. Bennett. 1995. The avifauna of remnant tallgrass prairie near Boulder, Colorado. The Prairie Naturalist **27(3):**147-157.

4. Boulder County. 1995. Boulder County comprehensive plan, environmental resources element. Boulder County Land Use Department, Boulder, Colorado.

5. Boulder County. 2002. Flagstaff Mountain cultural landscape district. Boulder County Land Use Department, Boulder, Colorado.

6. Buckner, D. 1991-2000. Summary data for monitoring tall grass natural area. ESCO Associates, Boulder, Colorado.

7. City of Boulder. 1996. City of Boulder grassland management: black-tailed prairie dog habitat conservation plan. City of Boulder Open Space Department, Boulder, Colorado.

8. City of Boulder. 1997. The north Boulder Valley inventory report and area management plan. City of Boulder Open Space Department, Boulder, Colorado.

9. City of Boulder, 1998. The South Boulder Creek area management plan. City of Boulder Open Space Department, Boulder, Colorado.

10. City of Boulder. 1999a. City of Boulder forest ecosystem management plan. City of Boulder Open Space Department; Boulder Mountain Parks Division, Parks and Recreation Department; Wildland Fire Division, Boulder Fire Department; Boulder, Colorado.

11. City of Boulder. 1999b. Charting the vision: integration and balance in the Boulder mountain parks: Boulder mountain parks resource protection and visitor use plan. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

12. City of Boulder. 2001a. Site management plan for Sombrero Marsh. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

13. City of Boulder. 2001b. Inventory of open space lands, city of Boulder, Colorado 1999. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

14. City of Boulder. 2001c. Boulder Valley comprehensive plan. City of Boulder Department of Community Design, Planning, and Development, Boulder, Colorado.

15. City of Boulder. 2002. Review of cultural resources: compatibility with visitor use and visitor infrastructure. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

16. City of Boulder. 2004. Forest inventory. Unpublished data. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

17. City of Boulder Open Space and Colorado Natural Areas Program. 1986. Colorado tallgrass prairie management plan. City of Boulder Open Space Department, Boulder, Colorado.

18. Clark, D.A, Crawford, C., and Jennings, W.F. 2001. Baseline plant survey of White Rocks and surrounding area in eastern Boulder County. City of Boulder Open Space and Mountain Parks Department, Boulder, Colorado.

19. Colorado Native Plant Society. 1997. Rare plants of Colorado, 2nd edition. Falcon Press, Helena, Montana.

20. Cooper, D.J., editor. 1994. Ecological survey of the city of Boulder, Colorado mountain parks. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

21. Fleischer-Mutel, C. and J.C. Emerick. 1992. From grassland to glacier: the natural history of Colorado and the surrounding region. Johnson Books, Boulder, Colorado.

22. Hogan, T. 1993. A floristic survey of the Boulder mountain park, Boulder, Colorado. Natural History Inventory of Colorado No. 13. University of Colorado Museum, Boulder.

23. Hogan, T. 1994. A floristic inventory of the Doudy Draw/Eldorado Mountain property. Unpublished report. City of Boulder Open Space Department. Boulder, Colorado.

24. Hogan, T. 1995. A report on the vegetation of the Flatirons area: Boulder mountain park, Boulder, Colorado. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

25. Jones, S.R. 1989. Distribution of small forest owls in Boulder County, Colorado. Boulder County Nature Association, Boulder, Colorado.

26. Jones, S.R. 1990. Managing mountain park ecosystems for birds and mammals. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

27. Jones, S.R. 1993a. A preliminary survey of avian species of special concern on the city of Boulder's Doudy Draw and Eldorado Mountain properties. Unpublished report. City of Boulder Open Space Department, Boulder, Colorado.

28. Jones, S. R. 1993b. Habitat use by breeding birds at the National Center for Atmospheric Research. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

29. Jones, S. R. 1993c. Snag densities and breeding bird populations in Eldorado Mountain area ponderosa pine forest. Unpublished report. City of Boulder Open Space Department, Boulder, Colorado.

30. Jones, S. R. 1994. Distribution of owls on city of Boulder's Doudy Draw and Eldorado Mountain open space properties. Unpublished report. City of Boulder Open Space Department, Boulder, Colorado.

31. Jones, S. R. 1996. Cliff community bird and mammal populations in the Boulder mountain park. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

32. Kingery, H.E., editor. 1998. The Colorado breeding bird atlas. Colorado Bird Atlas Partnership and Colorado Division of Wildlife. Denver, Colorado.

33. MacPhail, D.D., editor. 1970. White Rocks natural area study. Department of Geography, University of Colorado, Boulder.

34. Nelson, J.K. 1998. Rare plant survey and floristic checklist of Lost Gulch, city of Boulder mountain parks, Boulder, Colorado. Unpublished report. City of Boulder Mountain Parks Division, Parks and Recreation Department, Boulder, Colorado.

35. Pineda, P.M., A.R. Ellingson, and C.A. Pague. 1997. The systematic inventory of rare and imperiled butterflies on the city of Boulder open space and mountain parks and recommendations for their conservation. Colorado Natural Heritage Program, Fort Collins, Colorado.