

**CITY OF BOULDER**  
**OPEN SPACE BOARD OF TRUSTEES AGENDA ITEM**

**MEETING DATE: November 12, 2008**

**AGENDA TITLE:** Monitoring in the Eldorado Mountain / Doudu Draw Trail Study Area

**PRESENTER/S:** Open Space and Mountain Parks  
Michael D. Patton, Director  
Eric Stone, Resource Systems Division Manager  
Steve Armstead, Visitor Master Plan Implementation Coordinator  
Mark Gershman, Environmental Planner  
Will Keeley, Wildlife Ecologist

**EXECUTIVE SUMMARY**

The Eldorado Mountain / Doudu Draw Trail Study Area (EM/DD TSA) Plan identified three new trail connections in the TSA. The Flatirons Vista trails have been completed and have been opened to visitors. Spring Brook Loop in the Doudu Draw Natural Area and Goshawk Ridge Trail in the Eldorado Mountain Habitat Conservation Area (HCA) are under construction, and are anticipated to be completed and available for the public in November and December, respectively.

Efforts to complete and open Spring Brook Loop and Goshawk Ridge include a commitment to have in place a range of monitoring projects that aid the ability to assess and effectively respond to resource conditions or visitor experience that are in need of protection or improvement. Special on-trail travel restrictions on Spring Brook Loop for equestrians, bikes and dogs (on-leash) afford greater protection for the sensitive resources of the area. Staff will use observations of trail use to gauge compliance with regulations and undesignated trail monitoring, to assess the effectiveness of the requirements and to minimize off-trail travel. A visitor survey will provide information about visitor activity-related conflicts and direct staff's management response to ensure a good visitor experience for all. On Goshawk Ridge Trail, trail condition will be monitored to assess the sustainability of equestrian travel on the trail, and the condition of a stretch of previously undesignated trail that was incorporated into the trail alignment. Staff has also established monitoring projects that will augment information on wildlife resources and their use of the area and allow staff to assess any changes after trails are constructed.

On October 15, 2008 staff briefed the Open Space Board of Trustees on the proposal for sustainable recreation monitoring. On the following evening, staff held a public meeting to present and gather public input on the proposed recreational activity monitoring and associated indicators, thresholds and adaptive management responses. Staff also presented the trail-related wildlife monitoring projects underway with some preliminary data from the "pre-trail" (baseline) work.

Staff is returning to the Board for discussion of the Sustainable Recreational Activity monitoring planned for Spring Brook Loop and Goshawk Ridge Trail. Staff will also update the Board on trail related wildlife monitoring underway in the EM/DD TSA.

**STAFF RECOMMENDATION:**

This is an information item only. No action is required from the Open Space Board of Trustees. Staff is interested in any suggestions or comments the Board can offer.

**COMMUNITY SUSTAINABILITY ASSESSMENTS AND IMPACTS:**

- **Economic:** The Open Space and Mountain Parks (OSMP) program contributes to the economic vitality of the city because it provides the setting and services that help to attract a diversity of businesses and to recruit and retain employees.
- **Environmental:** Wildlife sampling in the EM/DD TSA uses passive techniques intended to cause minimal disturbance to wildlife. Monitoring information is intended to improve OSMP's ability to effectively protect environmental resources that support ecological sustainability.
- **Social:** Monitoring information is intended to improve OSMP's ability to effectively protect environmental resources that support the aesthetics of the visitor experience. Monitoring will also provide information that will help OSMP maintain high quality and safe trails and maintain a good visitor experience for all activities.

**OTHER IMPACTS:**

- **Fiscal:** Implementation costs are primarily for staffing. Funds for these expenses were anticipated in the current operating budget.
- **Staff time:** Wildlife monitoring projects required the hiring of a seasonal wildlife technician in the fall 2007; this position continues. Two seasonal ranger positions have been hired to assist with the sustainable recreation monitoring. Additional monitoring needs in EM/DD TSA fit into the work-plans of current staff.

**PUBLIC FEEDBACK:**

A public meeting was held on October 16, 2008 where staff presented both the sustainable recreation monitoring proposal and wildlife monitoring projects. Staff will incorporate comments from the community into a revised recreation monitoring plan. This item is being heard at this public meeting, advertised in the *Daily Camera* on November 9, 2008.

**ANALYSIS:**

**Background**

The Goshawk Ridge Trail in the Eldorado Mountain Habitat HCA and the Spring Brook Loop in the Doudy Draw Natural Area were identified for construction in the EM/DD TSA Plan (Attachment A). The Eldorado Mountain HCA and the portion of the Doudy Draw Natural Area where the Spring Brook Loop are located are especially sensitive landscapes with important natural and cultural resources. Both areas required OSMP staff to carefully consider potential impacts and protective measures. Spring Brook Loop passes through an area first recommended as an HCA but that was ultimately designated a Natural Area. With the high resource values of the area in mind, City Council directed

staff to keep track of the conditions and take appropriate actions to protect the resources found there. Staff has developed monitoring projects to track resource conditions, activities occurring on the new trails, and the effectiveness of strategies designed to reduce impacts in response to the direction contained in the EM/DD TSA and received from Council.

Staff hosted a public meeting on October 16, 2008 to address the community interest in the monitoring projects. The public meeting provided members of the community the opportunity to share their thoughts about the indicators, thresholds, and management responses in staff's Sustainable Recreation Monitoring Proposal (Attachment B). Staff also presented and discussed the wildlife monitoring program associated with the new trails. A summary document describing the range of wildlife monitoring projects underway along with some initial baseline information was provided at the public meeting (Attachment C).

### **Sustainable Recreation Monitoring**

Special activity requirements are included in the EM/DD TSA Plan to minimize potential resource impacts from visitor activities resulting from the new trails. The activity requirements include on-trail travel for equestrians, dogs, and bikes and dogs prohibited in the southern area of Spring Brook Loop. The recreational monitoring projects are intended to provide information to guide adaptive management responses if there are indications of the requirements not meeting specific expectations.

Both mountain biking and dog walking are new activities in the area west of Douly Draw Trail. OSMP is interested in learning more about the experience of visitors on the Spring Brook Loop where bikers, hikers, dog walkers and equestrians will be sharing the trail. Monitoring will inform management actions in response to conflicts that may degrade the visitor experience for some or all activities.

Goshawk Ridge Trail is built in an area with steep, highly erodable soils. The trail is designed to be minimally "developed" and integrates a portion of a pre-existing undesignated trail. Equestrian travel on the trail will be on a trial basis to ensure that the trail can hold up to equestrian use. OSMP monitoring will track trail condition using the indicators and standards developed as part of the OSMP's Trail Management Framework.

### **Wildlife Monitoring**

The Spring Brook and Bull Gulch drainages and nearby forested mesas and ridges are some of the few locations on OSMP that are used by locally uncommon species like elk, Merriam's wild turkey, dusky grouse, and forest hawks and owls. The area provides suitable habitat with minimal human disturbance favored by breeding turkeys, forest raptors and other sensitive wildlife species.

Wildlife monitoring projects established in the area west of Douly Draw are intended to gather information about wildlife's use of the area and to measure wildlife's response to new trail construction. Together, these efforts will help inform the need for management actions to protect resources and guide future trail management decisions in EM/DD and elsewhere in OSMP.

In 2007 and 2008, staff undertook multiple wildlife monitoring surveys in proximity to where Spring Brook Loop and Goshawk Ridge trails were to be built to establish pre-trail data. Staff conducted breeding surveys for forest raptors (owls and forest hawks), wild turkeys, northern leopard frogs, and forest songbirds. Other efforts included wild turkey roost observations, deer and elk bed mapping, and pellet plot surveys implemented to learn more about the distribution and abundance of turkey, deer, elk and other large animals. To account for potential animal population effects not due to trail effects and to help decipher ranges in variation (i.e., decrease in overall numbers due to harsh winter conditions), staff has established “control” plots on the Lindsay/Jeffco property, far from any trails. Monitoring will continue for four out of the next five years after trail construction and then twice more in the following five years to measure wildlife community responses.

In contrast to the sustainable recreation monitoring where thresholds and management responses were based upon trends as well as pre-existing standards and policy direction, no thresholds or standards are currently proposed for the wildlife monitoring component of EM/DD monitoring. Natural systems possess considerable inherent variation. Multiple seasons/years of wildlife monitoring may be required before any potential impacts can be identified. It may be necessary to analyze monitoring data over a period of time (i.e., not just current conditions) to establish an understanding of the range of inherent natural variation in indicators so that changes caused by manageable impacts can be addressed and an acceptable range of variation for wildlife effects established.

Wildlife surveys may also provide information to determine the need for visitor restrictions or additional protections from recreational disturbance to protect specific occurrences of sensitive and rare wildlife. Examples include restricting access near raptor nests or turkey roosts and not allowing off-trail permits in parts of the HCA during certain time periods of elk use.

### **Public Discussion on Trail Related Monitoring**

Comments were recorded from the public meeting and a post meeting comment period. Staff prepared a summary of the comments and staff responses (Attachment D).

Comments included:

1. suggestions on ways to clarify the monitoring proposal,
2. suggestions on refinements to management actions,
3. additional indicators and thresholds to consider, and
4. thoughts on broader policy considerations underlying the monitoring.

Staff will incorporate several suggested changes into the Sustainable Recreation Monitoring proposal based upon the public discussion and input. Examples of the changes include:

- minor adjustments to trail design as a trail modification would be considered in the least restrictive management responses for Spring Brook Loop conflict monitoring,
- the addition of directional travel as a least restrictive option for Spring Brook Loop conflict monitoring,
- modify the existing trail to include minor reroutes or spur trails to popular overlooks or resting spots as potential management responses for undesignated trail monitoring.

During the conversation on the wildlife monitoring program, several comments regarding the absence of acceptable ranges of variation for wildlife species and trail related vegetation monitoring were discussed. Appendix D includes staff's responses to these questions.

**Next Steps**

All pre-trail baseline wildlife monitoring has been completed. Staff is completing the baseline sustainable recreation monitoring necessary before Spring Brook Loop and Goshawk Ridge are opened for visitors. After the designation and opening of the new trails, monitoring will begin to collect information on visitor and resource conditions related to the new trails.

Submitted by:

---

Michael D. Patton, Director

---

Eric Stone, Resource Systems Division Manager

---

Steve Armstead, Visitor Master Plan Implementation Coordinator

---

Mark Gershman, Environmental Planner

---

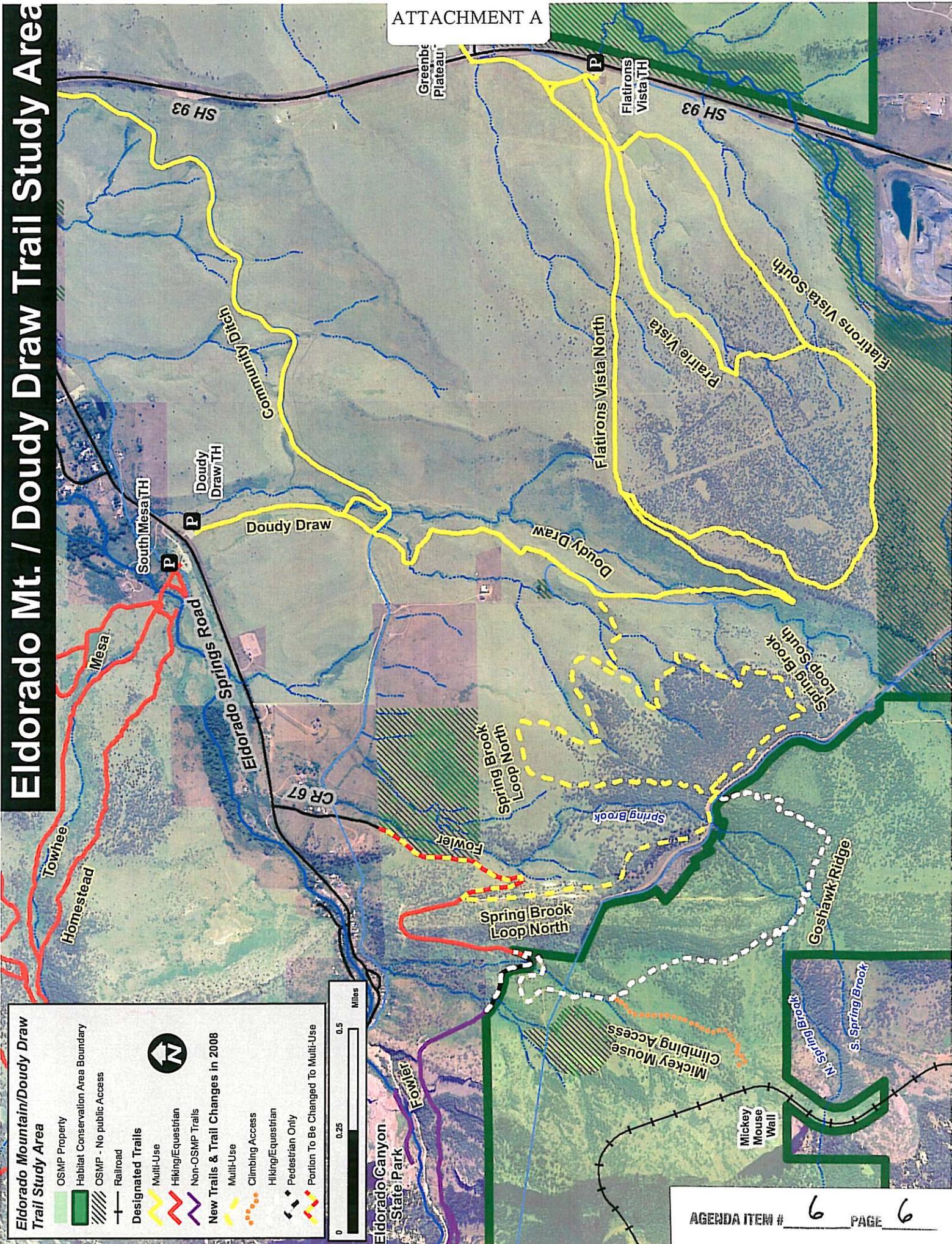
Will Keeley, Wildlife Ecologist

**ATTACHMENTS:**

- A: Eldorado Mountain / Doudy Draw New Trails Map
- B: Sustainable Recreation Monitoring
- C: New Trail Related Wildlife Monitoring
- D: Public Comments and OSMP Response

# Eldorado Mt. / Doudy Draw Trail Study Area

ATTACHMENT A



**Eldorado Mountain/Doudy Draw Trail Study Area**

- OSMP Property
- Habitat Conservation Area Boundary
- OSMP - No public Access
- Railroad
- Designated Trails**
  - Multi-Use
  - Hiking/Equestrian
  - Non-OSMP Trails
- New Trails & Trail Changes in 2008**
  - Multi-Use
  - Climbing Access
  - Hiking/Equestrian
  - Pedestrian Only
  - Portion To Be Changed To Multi-Use

Miles  
0 0.25 0.5

**Sustainable Recreation Monitoring**  
Eldorado Mountain/Doudy Draw Trail Study Area  
Spring Brook/Goshawk Ridge Area  
October 7, 2008



**Working Together for Sustainable Recreation and Resource Protection  
on Spring Brook Loop and Goshawk Ridge Trails**

The following document contains a suite of proposed trail and activity monitoring efforts associated with two new trails, Spring Brook Loop and Goshawk Ridge in the Eldorado Mountain / Doudy Draw Trail Study Area (EM/DD TSA). The purpose of the monitoring work is to inform our adaptive management responses so that recreational opportunities can be maintained in the manner intended and natural resource protection goals achieved. The purpose of this document is to provide a framework for a community discussion on the monitoring to be carried out, expectations that determine desired conditions, and actions that OSMP will consider to maintain these desired conditions.

To maintain a quality recreational opportunity for all activities and to reduce resource impacts, special on-trail regulations, activity specific restrictions, and trial periods for select activities were established on Spring Brook Loop and Goshawk Ridge Trail. Achieving the desire condition of sustainable recreation and resource protection requires that visitors comply with the recommendations, be mindful of impacts to resources and other visitor activities, and work with OSMP to reduce and mitigate problems. OSMP is responsible for working with the community and stakeholders to implement strategies that allow desired conditions to be maintained and when possible enhanced.

The EM/DD TSA Plan states that OSMP will consider both restrictions to activities and modifications to trail design in response to unacceptable levels of regulatory compliance. OSMP will focus on strategies to accommodate the on-trail visitor activities specified in the plan.

Proposed monitoring efforts include thresholds that would be used to trigger a set of “less restrictive” strategies. These include making modifications to trails, changes to signs and educational messages, increased enforcement, and even seasonal access restrictions. There may be cases however, where these approaches prove to not be effective and additional visitor access restrictions may be necessary. Collectively, these monitoring approaches will form the basis for decisions on visitor access restrictions. OSMP managers will consider the totality of the situation (e.g., compliance estimates, trail condition status, wildlife effects, and community input) when making decisions about restrictions to visitor access.

Upon constructing and opening these trails, OSMP will work hard to promote sustainable recreation and protect the incredible natural resources of the area.

**Sustainable Recreation Monitoring**  
Eldorado Mountain/Doudy Draw Trail Study Area  
Spring Brook/Goshawk Ridge Area  
October 7, 2008



**Proposed Sustainable Recreation Monitoring Projects**

**Spring Brook Loop Trail**

1. On-Trail Travel & Dog Regulation Monitoring - *Ranger Patrol & Contact*
2. On-Trail Travel Monitoring - *Trail Segment Observation*
3. Undesignated Trail Monitoring – *Evaluation of Location, Condition and Extent*
4. Dog Regulation Monitoring - *Trail Segment Observation*
5. Recreation Conflict Monitoring – *Visitor Survey*

**Goshawk Ridge Trail**

Sustainability of Equestrian Travel

1. Trail Condition Monitoring – *Evaluation of Changes in Tread Width & Incision*
2. Undesignated Trail Monitoring – *Evaluation of Location, Condition and Extent*

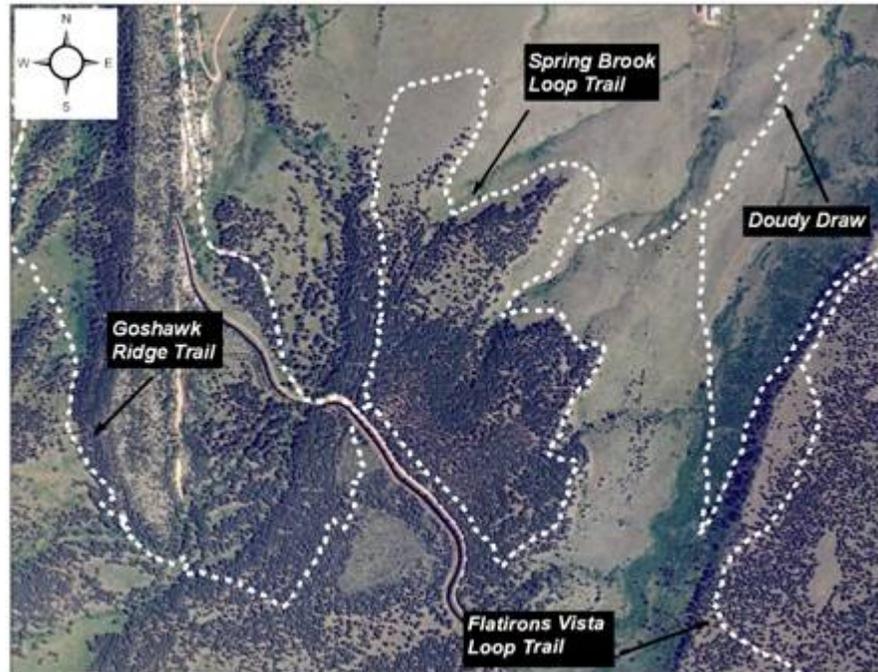
Physical Sustainability of Segment Two

1. Trail Condition Monitoring – *Trail Condition & Undesignated Trail Development*

## Spring Brook Loop Trail On-Trail Travel & Dog Regulation Monitoring – *Ranger Patrol and Contact*

**Objective:** Track the frequency with which rangers encounter visitors and dogs off-trail<sup>1</sup> or out of compliance with area specific dog regulations. Concurrently, educate visitors about the resources and regulations in effect at Spring Brook Loop Trail and provide regulatory enforcement.

**Methods:** Rangers will patrol the Spring Brook Loop Trail and tally parties<sup>2</sup> of cyclists, equestrians, and pedestrians observed on and off the trail. Rangers will also tally the number of dog guardians observed and whether or not they complied with the specific dog regulations in effect. The ranger on patrol will contact cyclists, equestrians, and dog guardians who are out of compliance with regulations to gather information



(e.g., reasons for going off trail, visitors' awareness of Spring-Brook Loop Trail regulations). Rangers will also provide information about the resources OSMP is seeking to protect and the rules in effect to accomplish this and provide warnings and issue citations as appropriate. Rangers will report the percentage of visitor parties observed off-trail or out of compliance with monitored dog regulations to inform management decisions.

<sup>1</sup>Off-trail means that all of a person's feet/horse's hooves/dog's feet/or bike's tires are off the trail tread. Exceptions to this definition are:

- a) A person leaving the trail tread yielding to another visitor
- b) A person leaving the trail tread to pass another visitor
- c) A person leaving the trail to avoid an isolated obstacle, where the person returns to the trail once past the obstacle
- d) A dog leaving the trail for fewer than 30 seconds and traveling no further than ten feet from the trail margin

<sup>2</sup> A visitor party is defined as an individual or group of individuals who, in the opinion of the observer, appear to be visiting OSMP as one unique group.

### Thresholds and Responses for On-Trail Travel

Threshold	Response
≥95% observed on-trail compliance of equestrian parties, bike parties, and parties with dogs	<ol style="list-style-type: none"> <li>1. Maintain or consider reducing levels of outreach, education and patrol</li> <li>2. Acknowledge/Thank visitors</li> </ol>
< 95% observed on-trail compliance of equestrian parties, bike parties, and parties with dogs	<ol style="list-style-type: none"> <li>3. Close and restore undesignated trails</li> <li>4. Changes in education, outreach, signs, or enforcement</li> <li>5. Address maintenance concern(s) on designated trails that have resulted in off-trail travel</li> <li>6. Create physical barriers to keep people on trail</li> <li>7. Meet with stakeholders and implement strategies aimed at improving compliance</li> <li>8. Seasonal or temporary access restrictions</li> </ol>
<p>OSMP would use values and trends of this indicator, along with those from trail segment observation and undesignated trail monitoring to make determinations about prohibiting a particular activity</p> <p>Adopting regulations prohibiting specific activities would be considered after less restrictive strategies were demonstrated to be ineffective at achieving targeted compliance rates</p>	<ol style="list-style-type: none"> <li>9. Prohibit off-trail travel by pedestrians</li> <li>10. Disallow one or more activity groups on Spring Brook Loop Trail</li> </ol>

### Thresholds and Responses for Dogs On-Leash

Threshold	Response
≥90% of parties comply with on-leash requirements	<ol style="list-style-type: none"> <li>1. Maintain or consider reducing existing levels of education, outreach and enforcement</li> <li>2. Acknowledge/Thank visitors</li> </ol>
<90% of parties comply with on-leash requirements	<ol style="list-style-type: none"> <li>3. Changes in education, outreach, signs, or enforcement</li> <li>4. Meet with stakeholders and implement strategies aimed at improving compliance</li> </ol>
<p>OSMP would use values and trends of this indicator for on-leash compliance, along with levels of on-leash compliance measured during trail segment observations to make determinations about prohibiting dogs</p> <p>Adopting regulations prohibiting dogs would be considered after less restrictive strategies were demonstrated to be ineffective at achieving targeted compliance rates</p>	<ol style="list-style-type: none"> <li>5. Disallow parties with dogs on the Spring Brook Loop Trail</li> </ol>

**Considerations:**

- The potentially low numbers of equestrians and dogs may make it difficult or cost prohibitive to obtain desired sample size
- Ranger presence may influence visitor behavior. Compliance is likely to change when rangers are absent or under reduced levels of patrol.

## Spring Brook Loop Trail Undesignated Trail Monitoring – *Evaluation of Location, Condition & Extent*

**Objective:** Locate, measure, and characterize the condition of undesignated trails near the Spring Brook Loop Trail.

**Methods:** OSMP will document the location, length, condition class<sup>3</sup>, and discernable visitor activity on undesignated trails in a defined area around the Spring Brook Loop Trail. Undesignated trails include parallel trails, shortcutting of climbing turns and undesignated trails to new destinations. Photographs will also be used to document undesignated trail condition and any type of discernable visitor activity.

### Thresholds and Responses

Threshold	Response
Reduction in the extent of pre-existing undesignated trails and Conditions of pre-existing trails are less severe and No new undesignated trails detected	<ol style="list-style-type: none"> <li>1. Close and restore any remaining undesignated trails</li> <li>2. Maintain or consider reducing levels of education, outreach and patrol</li> <li>3. Acknowledge/Thank visitors</li> </ol>
No reduction in the extent or condition of pre-existing undesignated trails or Conditions of pre-existing trails more severe or New undesignated trails detected	<ol style="list-style-type: none"> <li>4. Close and restore undesignated trails</li> <li>5. Change education, outreach, signs, or enforcement</li> <li>6. Address maintenance concern(s) on designated trail that have resulted in off-trail travel</li> <li>7. Create physical barriers to keep people on trail</li> <li>8. Meet with stakeholders and implement strategies aimed at improving compliance</li> <li>9. Seasonal or temporary access restrictions</li> </ol>
OSMP would use values and trends of this indicator, along with those from trail segment observation and ranger patrols to make determinations about prohibiting a particular activity  Adopting regulations prohibiting specific activities would be considered after the use of less restrictive strategies and clear indication of off-trail travel by a particular activity	<ol style="list-style-type: none"> <li>10. Prohibit off-trail travel by pedestrians</li> <li>11. Disallow one or more activity groups on the Spring Brook Loop Trail</li> </ol>

<sup>3</sup> As described in: Marion, J.L., Leung, Y., Nepal, S.K., 2006. Monitoring trail conditions: new methodological considerations. *The George Wright Forum* 23:36-29.

**Considerations:**

- Clear evidence of undesignated trail use by a particular activity may be difficult to determine. When hoof prints, foot prints, bike tire treads, etc. are present, they suggest a visit by a person engaged in an activity; however other activities may have contributed to the establishment and impact of the trail.

**Spring Brook Loop Trail  
On-Trail Travel Monitoring – Trail Segment Observation**

**Objective:** Estimate the percentage of cyclists, equestrians, pedestrians, and dogs that remain on observed trail segments.

**Methods:** Observer(s) stationed will document parties of cyclists, equestrians, pedestrians, and dogs staying on or leaving specific segments of the Spring Brook Loop Trail.

**Thresholds and Responses**

Threshold	Response
≥95% on-trail compliance of equestrian parties, cycling parties and parties with dogs	<ol style="list-style-type: none"> <li>1. Maintain or consider reducing existing levels of education, outreach and enforcement</li> <li>2. Acknowledge/Thank visitors</li> </ol>
<95% on-trail compliance of equestrian parties, cycling parties and parties with dogs	<ol style="list-style-type: none"> <li>3. Changes in education, outreach, signs, or enforcement</li> <li>4. Address maintenance concern(s) on designated trail that have resulted in off-trail travel</li> <li>5. Create physical barriers to keep people on trail</li> <li>6. Meet with stakeholders and implement strategies aimed at improving compliance</li> <li>7. Seasonal or temporary access restrictions</li> </ol>
<p>OSMP will examine the rate of compliance and visitation levels observed from each activity, along with data from ranger patrols and undesignated trail monitoring to make determinations about prohibiting or restricting a particular activity</p> <p>Adopting regulations prohibiting specific activities would be considered after less restrictive strategies were demonstrated to be ineffective at achieving targeted compliance rates</p>	<ol style="list-style-type: none"> <li>8. Prohibit off-trail travel by pedestrians</li> <li>9. Disallow one or more activity groups on the Spring Brook Loop Trail</li> </ol>

## Considerations

- Only a small fraction of a visitor's trip will be observed at each location. This method does not allow OSMP to estimate the actual rates of compliance for visitors' trips through the Spring Brook Loop Trail. We can only derive an estimate for the portion of the trip that is observed
- While the Visitor Master Plan (pg. 63) proposes a 95% overall compliance with on-trail regulations, OSMP cannot translate sample compliance rates to overall compliance rates. If the sample compliance rate is below 95%, then the trail-wide compliance is also below 95%. It is possible that the overall compliance may even be much lower than the rate observed at a small portion of the trail.

## Spring Brook Loop Trail Dog Regulation Monitoring - Trail Segment Observation

**Objective:** Estimate the rate of dog guardians complying with regulations requiring dogs to be leashed or prohibiting dogs on observed segments of the Spring Brook Loop Trail.

**Methods:** Observer(s) will document parties with dogs that are leashed or unleashed on monitored trail segments. They will also document parties with dogs that comply or do not comply with dog prohibitions on the southern segment of Spring Brook Loop Trail. The percentage of parties with dogs in compliance with leash and dogs-prohibited restrictions will be calculated and reported.

### Thresholds and Responses

Threshold	Response
<p>≥90% of parties comply with on-leash requirements and ≥90% of parties comply with dog prohibition on the southern Spring Brook Loop Trail</p>	<ol style="list-style-type: none"> <li>1. Maintain or consider reducing existing levels of education, outreach and enforcement</li> <li>2. Acknowledge/Thank visitors</li> </ol>
<p>&lt;90% of parties comply with on-leash requirements; or &lt;90% of parties comply with dog prohibition in southern Spring Brook Loop Trail</p>	<ol style="list-style-type: none"> <li>3. Changes in education, outreach, signs, or enforcement</li> <li>4. Meet with stakeholders and implement strategies aimed at improving compliance</li> </ol>
<p>OSMP would use values and trends of this indicator for on-leash compliance, along with levels of on-leash compliance measured during ranger patrols to make determinations about prohibiting dogs. To make determinations about compliance with dog prohibited on the southern Spring Brook Loop, OSMP would only use values and trends of this indicator.</p> <p>Adopting regulations prohibiting dogs would be considered after less restrictive strategies were demonstrated to be ineffective at achieving targeted compliance rates</p>	<ol style="list-style-type: none"> <li>5. Disallow parties with dogs on the northern Spring Brook Loop Trail</li> </ol>

**Considerations:**

- Since only a small fraction of dog guardians' trips will be observed, this method does not allow OSMP to estimate the actual on-leash compliance rates on the Spring Brook Loop Trail. OSMP will derive an estimate for the portion of the trip that is observed. That rate is probably lower than the actual rate of compliance for the entire trip.
- The EM/DD TSA (pgs. 17 & 35) proposes a standard of 85-90% for compliance with on-leash dog regulations. OSMP cannot translate on-leash compliance rates for a portion of the trail to compliance rates for the entire trip along the trail; however if the compliance rate for a small portion of the trail is below 90%, then the trail-wide compliance is also below 90%. It is possible that the overall compliance may be much lower than the rate observed along a small portion of the trail.
- The potentially low numbers of parties with dogs may make it difficult or cost prohibitive to obtain desired sample size.

## Spring Brook Loop Trail Recreation Conflict Monitoring – Visitor Survey

**Objective:** Estimate the percentage of visitors who experience conflict arising from interactions with other visitors on the Spring Brook Loop Trail.

**Methods:** Visitors exiting the Spring Brook Loop Trail will be asked to complete a questionnaire.

### Thresholds and Responses

Threshold	Response
<p>≤20% of visitors report having ever experienced conflict in the Spring Brook Loop Trail area and</p> <p>≤5% report having experienced conflict in the Spring Brook Loop Trail area on the day of the survey.</p>	<ol style="list-style-type: none"> <li>1. Maintain or consider reducing existing levels of education, outreach and enforcement</li> <li>2. Acknowledge/Thank visitors</li> </ol>
<p>&gt;20% of visitors report having ever experienced conflict in the Spring Brook Loop Trail area or</p> <p>&gt;5% report having experienced conflict in the Spring Brook Loop Trail area on the day of the survey.</p>	<ol style="list-style-type: none"> <li>3. Changes in education, outreach, signs, or enforcement</li> <li>4. Meet with stakeholders and implement strategies aimed at reducing conflict (e.g., bike patrol, dog walker patrol)</li> <li>5. Spatial or temporal activity separation</li> <li>6. Construct trail modifications (e.g., obstacles to slow speed)</li> </ol>
<p>Adopting regulations prohibiting specific activities would be considered after less restrictive strategies were demonstrated to be ineffective at achieving targeted compliance rates</p>	<ol style="list-style-type: none"> <li>7. Disallow cyclists, equestrians, or dogs on the Spring Brook Loop Trail</li> </ol>

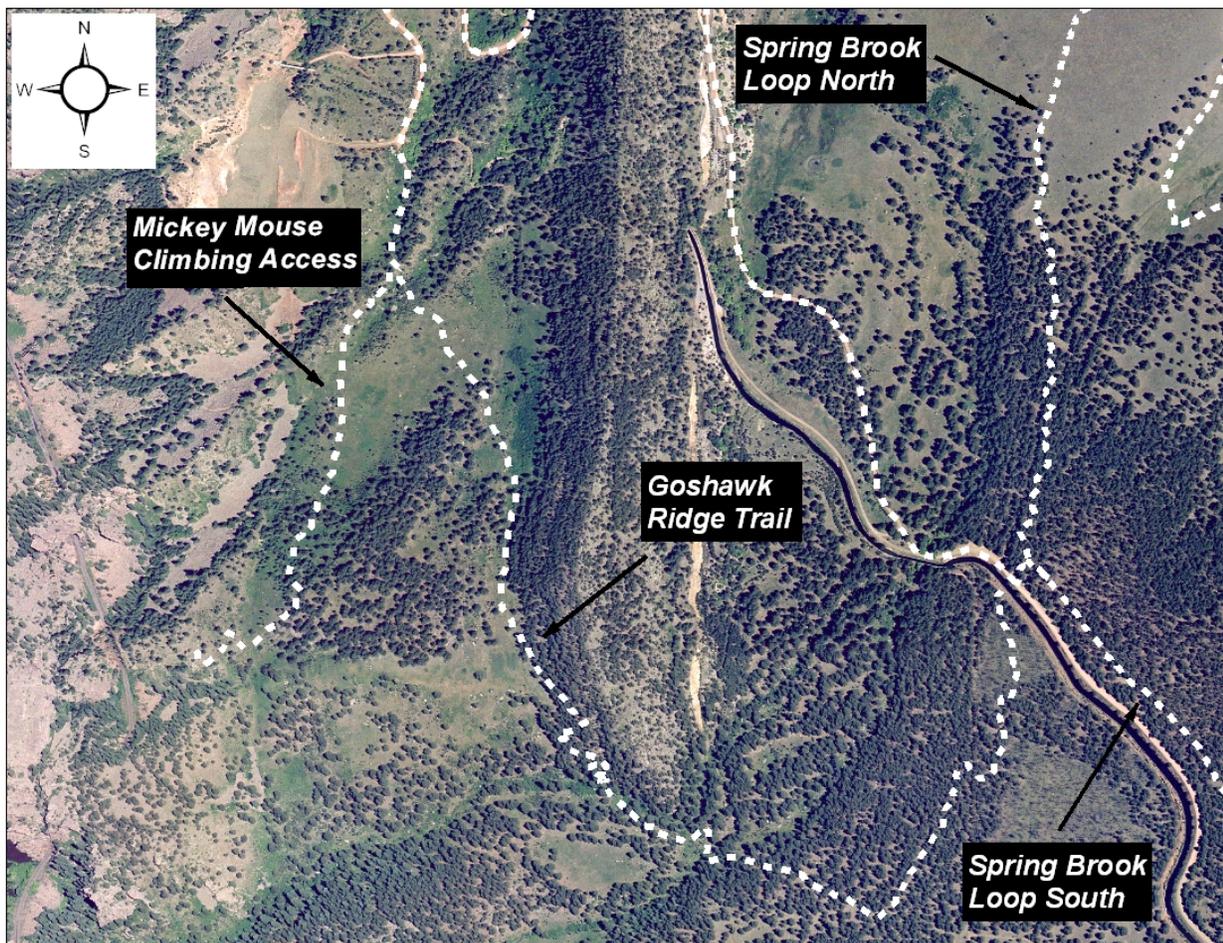
### Considerations:

- Changes in reported level of conflict after implementation of a management response may be due to a variety of demographic or activity level shifts rather than the effectiveness of management strategies. For example, the displacement of visitors (e.g., non-cyclists abandon the area because of high conflict with cyclists) could reduce conflict, but only as a result of an activity group avoiding the trail.
- The potentially low number of equestrians and individuals with dogs on the trail may make it difficult or cost prohibitive to obtain desired sample sizes.

**Goshawk Ridge Trail**  
**Equestrian Activity Sustainability**  
**Trail Condition Monitoring – *Evaluation of Changes in Tread Width & Incision***

**Objective:** Estimate the change in tread width and incision on the Goshawk Ridge Trail.

**Methods:** OSMP will measure tread width and tread incision at intervals along the trail. Any point along the trail greater than 45 inches wide (not including constructed fords or switchbacks) will also be documented. Any point along the trail with tread incision five inches greater than the median baseline incision or any trail section with more than 10 feet of continuous tread incision at least two inches greater than the median baseline incision will also be documented.



## Thresholds and Responses

Threshold	Response
<p>The trail width is not more than 45 inches wide anywhere</p> <p style="text-align: center;">and</p> <p>The trail is not incised more than five inches from baseline median anywhere</p> <p style="text-align: center;">and</p> <p>No section of the trail 10 feet or longer is incised two inches or more beyond baseline median</p> <p style="text-align: center;">and</p> <p>≤ 25% of tread width sample points &gt;30 inches</p> <p style="text-align: center;">and</p> <p>≤25% of incision sample points incised two inches or more beyond baseline median</p>	<ol style="list-style-type: none"> <li>1. Continue routine maintenance</li> <li>2. Acknowledge/Thank visitors</li> </ol>
<p>Any point where the trail width is greater than 45 inches</p> <p style="text-align: center;">or</p> <p>Any point where the trail is incised more than five inches from baseline median</p> <p style="text-align: center;">or</p> <p>Any section of trail 10 feet or longer incised two inches or more beyond baseline median</p>	<ol style="list-style-type: none"> <li>3. Immediately correct to trail design standard (Class 2 Equestrian Trail) through maintenance or minor trail adjustments</li> </ol>
<p>Trail Width: &gt;25% of sample points &gt;30 inches</p> <p style="text-align: center;">or</p> <p>Incision: &gt;25% of sample points are incised 2 inches or more beyond baseline median</p>	<ol style="list-style-type: none"> <li>4. Correct to trail design standard (Class 2 Equestrian Trail) through maintenance or minor trail adjustments</li> <li>5. Add additional trail/drainage structures</li> <li>6. Changes in education, outreach, signs, or enforcement</li> <li>7. Physical barrier/s to restrict widening</li> <li>8. Meet with stakeholders to determine strategies to minimize tread incision and trail widening associated with visitor activity</li> <li>9. Cover excess width with locally harvested organic material</li> <li>10. Visitor activity restrictions (e.g., temporal closure)</li> </ol>
<p>Clear indication of off-trail travel by equestrians</p> <p>Prohibiting equestrian activities would be considered after less restrictive strategies were demonstrated to be ineffective at achieving targeted compliance rates</p>	<ol style="list-style-type: none"> <li>11. Disallow equestrians on the Goshawk Ridge Trail</li> </ol>

**Considerations:**

- Monitoring does not include the provisional use of segments one (Conda Mine Road) or two<sup>4</sup>.
- While OSMP may observe increases in tread width or incision, it may be difficult to determine that equestrian use is responsible for the observed change. Other visitors, wildlife, or other factors (e.g., weather, trail design elements, slope, and soil type) can affect tread width and incision.
- OSMP's trail design specifications (trail classes and standards) are a credible first iteration of standards adapted from other land management agencies by OSMP staff. On the ground experience *across* the OSMP system, including the Goshawk Ridge Trail, will provide information about how and if OSMP's trail classes should be adjusted to address "real world" conditions.

For example, if monitoring consistently demonstrated trail widening and incision resulted from legitimate visitor activity, OSMP could respond in three ways. First, the department could attempt to maintain the trail to the original class by increasing the maintenance frequency. This is likely to be expensive, time-consuming, and potentially unsustainable. Another alternative would be to change the allowed activities, reducing them to those that would likely allow the original trail class to be sustainable without increasing maintenance. The third alternative is to change the trail class (and thus design) to accommodate the levels of allowed activities.

---

<sup>4</sup> Segment two is the stretch of previously undesignated trail now incorporated into the trail. Segment two will be monitored through an already approved threshold and response framework.

**Goshawk Ridge Trail  
Equestrian Activity Sustainability  
Undesignated Trail Monitoring - *Evaluation of Location, Condition & Extent***

**Objective:** Characterize the condition and extent of undesignated trails adjacent, parallel, or emanating from the Goshawk Ridge Trail.

**Methods:** OSMP will document the location, length, condition class (Marion et al., 2006<sup>5</sup>), and discernable visitor activity on undesignated trails intersecting or parallel to the Goshawk Ridge Trail. Undesignated trails include parallel trails, shortcutting of climbing turns and undesignated trails to new destinations. Photography will be used to document undesignated trail condition and discernable visitor activity.

**Thresholds and Responses**

Threshold	Response
Reduction in the extent of pre-existing undesignated trails and Conditions of pre-existing trails less severe and No new undesignated trails detected	1. Close and restore remaining undesignated trails 2. Maintain or consider reducing levels of education, outreach and patrol 3. Acknowledge/Thank visitors
No reduction in the extent or condition of pre-existing undesignated trails or Conditions of pre-existing trails more severe or New undesignated trails detected	4. Close and restore undesignated trails 5. Changes in education, outreach, signs, or enforcement 6. Strengthen “stay off undesignated trail” message in off-trail permit guidelines 7. Address maintenance concern(s) on designated trail that have resulted in off-trail travel 8. Create physical barriers to keep people on trail 9. Meet with stakeholders and implement strategies aimed at improving compliance 10. Re-route part of trail 11. Access restrictions (e.g., seasonal closure)
Clear indication of off-trail travel by equestrians  Regulations prohibiting equestrian activities would be considered after less restrictive strategies were demonstrated to be ineffective at achieving targeted compliance rates	12. Disallow equestrians on the Goshawk Ridge Trail

<sup>5</sup> Marion, J.L., Leung, Y., Nepal, S.K., 2006. Monitoring trail conditions: new methodological considerations. The George Wright Forum 23:36-49.

**Considerations:**

- While OSMP may observe new undesignated trails, staff may not be able to determine that equestrian travel is responsible for the new trail or at what level and frequency of activity that changed occurred. Other visitors or wildlife can contribute/or cause new undesignated trail development.

## Goshawk Ridge Trail

### Physical Sustainability of Segment Two (Incorporated undesignated trail section) Trail Condition Monitoring – *Trail Condition & Undesignated Trail Development*

**Objective:** Estimate the change in tread width, tread incision, trail braiding, and undesignated trail development on Segment Two of the Goshawk Ridge Trail. OSMP will also track the number of structures (e.g. drainage bars, steps etc.) in place or recommended for improving the physical sustainability of the trail.

**Background:** OSMP included a section of an undesignated trail into the alignment of the Goshawk Ridge Trail on a provisional basis. Although, this section will be subject to some initial maintenance and minor improvements prior to trail opening, it was not designed or constructed to OSMP trail standards as were other sections of the trail. OSMP is committed to early detection and correction of problems with the physical sustainability of this part of the trail. OSMP developed a site-specific monitoring program for this purpose.

Thresholds have been set for indicators that specify an acceptable amount of change. If the indicator falls outside the threshold, management options are identified to return the segment to acceptable conditions. Thresholds and management options have been developed for each indicator. By the end of 2010, staff will evaluate the physical condition of Segment Two, monitored natural resources, and visitation levels to determine if a different alignment is necessary.

**Methods:** OSMP will measure tread characteristics at intervals along the trail. Tread width and trail braiding will be documented in linear length based upon the respective indicator standard and each trail braiding occurrence will be assigned a condition class. Any point along the trail with undesignated trail development will also be documented. OSMP will document the location, length, condition class (Marion et al., 2006<sup>6</sup>), of undesignated trails intersecting or parallel to the Goshawk Ridge Trail. Photography will be used to document undesignated trail condition and discernable visitor activity.

OSMP will also keep track of the number of structures (e.g., drainage dips, water bars, or steps) constructed to support the physical sustainability of the trail, and the number of such structures recommended to address trail degradation.

Monitoring will continue to determine the effectiveness of corrective actions. If over the long term, continued maintenance and new infrastructure fail to maintain indicators within the range of acceptability, a trail reroute will be considered for this section of trail.

---

<sup>6</sup> Marion, J.L., Leung, Y., Nepal, S.K., 2006. Monitoring trail conditions: new methodological considerations. The George Wright Forum 23:36-29.

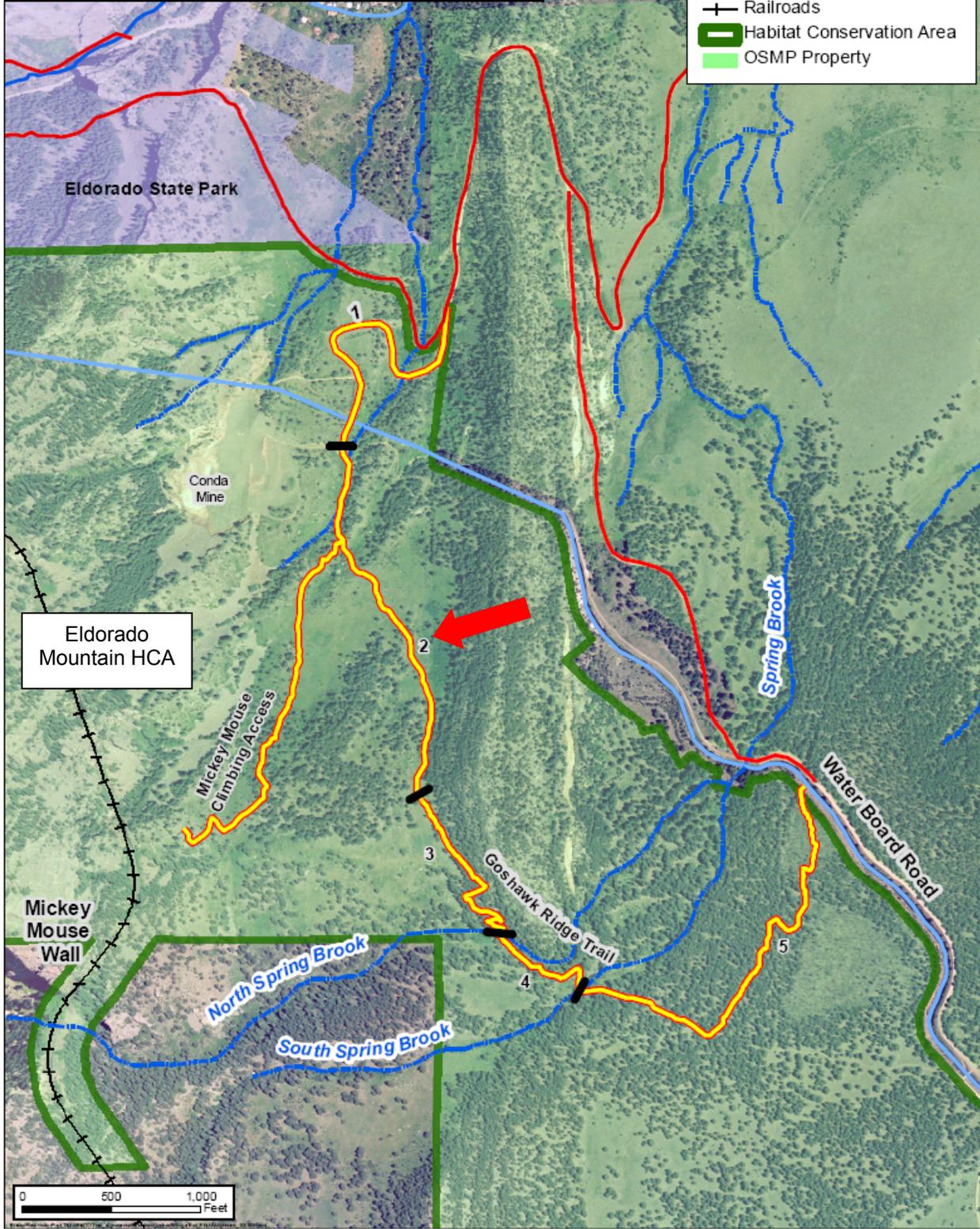
## Thresholds and Responses

Indicator	Thresholds	Possible Management Responses
Trail Width	< or = 2.5ft	None (acceptable)
	2.5-3ft	De-berm trail tread, drain dips
	>3ft, < 200 linear ft	Add use of wood or rock water bars and risers
	>3ft, > 200 linear ft	Re-route
Presence of Trail Braiding	Condition Class 0	None (acceptable)
	Condition Class 1	Install drainage structure, temporary closure
	Condition Class 2-3, <100 linear ft	Install drainage structure, temporary closure
	Condition Class 2-3, >100 linear ft	Re-route
Trail Tread Incision/Depth	0-2 inches	De-berm trail tread and drain dips
	3-7 inches	Add use of rock or wood water bars
	> or = 8 inches	Add use of risers
Number of Undesignated Trails	no trails	None (acceptable)
	1-3 trails	Take action to close undesignated trails that is consistent with condition class, increase ranger patrols, adjust number of off-trail permits
	>3 Undesignated trails	Re-route
	Presence of Condition Class 3 trail	Re-route
Undesignated Trail Condition Class	Condition Class 0-1	Install closure sign
	Condition Class 2	Install closure sign, seeding (if needed) and matting, increase ranger patrol
	Condition Class 3	Re-route
Number of Structures	<30 structures/ Segment 2	None (acceptable)
	> 30 structures/ Segment 2	Re-route

# Goshawk Ridge Trail Alignment



- Designated Trails
- + Railroads
- ▭ Habitat Conservation Area
- ▭ OSMP Property



## ATTACHMENT C



Open Space and Mountain Parks Visitor Master Plan  
EM/DD Trail Study Area  
**Wildlife Monitoring Projects 2008-2009**  
**Spring Brook Loop and Goshawk Ridge Trail**

11/3/2008

### **Wildlife Monitoring in the EM/DD TSA for New Trails**

The Eldorado Mountain / Doudy Draw Trail Study Area plan specifically directs wildlife monitoring to: 1) collect more information to augment existing baseline data; 2) measure changes in wildlife abundance and use patterns in response to new trail construction.

As such, monitoring to assess the impacts of new trails on wildlife in this area began in July 2007. While some surveying efforts (e.g., ungulate bed mapping and turkey roost observations) continue, staff completed other surveys used to establish current condition (pre-trail development) in September 2008. These efforts included: bird surveys in Spring Brook and throughout the study area, pellet plots used to detect changes in deer, elk, and turkey abundance in the vicinity of new trails, and forest raptor surveys. Our future monitoring schedule to assess trail impacts in the TSA is set for years 1, 2, 3, 5, 7, 10 post trail construction.

Listed below are descriptions of the monitoring projects that will be continued in future years, their objectives, and a brief methodology. It is important to note that OSMP staff's total 2008 work effort on wildlife monitoring projects was approximately 220 person days.

### **Pellet Plot Monitoring for Deer, Elk and Wild Turkey**

**Objective:** This sampling provides us with current condition (pre-trail development baseline data) on the amount of use of these areas by mule deer, elk and wild turkeys. Re-sampling these pellet plots (post-trail development) will provide an estimate of the effect these trails have on certain wildlife species as well as continue to help us understand wildlife use patterns (temporal and spatial) in the area.

**Methods:** We randomly placed 5m radius circle plots in the vicinity of the Spring Brook Loop and Goshawk Ridge Trails to act as treatments as well as two "control" areas away from trails. Control plots will serve as indicators of population level changes (i.e., not trail associated) such as disease and effects of weather and will be cleared simultaneously with treatment plots. Control samples are also invaluable in determining the natural variation inherent in wildlife use indices.

Plots are cleared of all animal droppings. For each plot, staff records the species present, number of pellets and number of pellet groups (any group of pellets  $\geq$  5 pellets). These are the metrics of interest. We cleared 25 treatment and 25 control plots for Spring

## ATTACHMENT C

Brook Loop and 88 treatment and 25 control plots for Goshawk Ridge Trail. The increased number of treatment plots for Goshawk Ridge Trail will allow staff to estimate the distance of the trail effect on species' use of the area.

Spring Brook Loop Trail pellet plot sampling schedule is between 3-9 months. Treatment and control plots were simultaneously cleared in 7/07, 10/07, and 7/08. Clearing events in 2009 are planned in 7/09 and 10/09.

Goshawk Ridge Trail sampling schedule is ~10 months. Treatment and control plots were simultaneously cleared in 11/07 and 9/08. Clearing events in 2009 are planned in 9/09.

**2008 work effort = 56 person days**

### Deer and Elk Bed Mapping

**Objective:** Augment existing data on local habitat preferences for ungulate (deer and elk) resting sites to inform future management decisions regarding trail placement, and to identify heavily used bedding sites in EM/DD TSA that can be monitored in the future for evidence of re-use after trail development.

**Methods:** Staff located beds by walking line transects, spaced 50m apart. We collect site specific data on a subset of beds located, including but not limited to: current bed condition, canopy cover, habitat type (grassland or forest), bed aspect, nearest tree species, its distance to the bed, and its diameter at breast height.

**2008 work effort = 1685 total beds mapped in EM/DD TSA: 900 with bed characteristic data collected.**

### Wild Turkey Activity and Roost Site Monitoring

**Objective:** Locate active turkey roosts, categorize user groups and monitor seasonal use of roosts before and after trail construction.

**Methods:** We walked line transects 100m apart and identified potential sites that indicated signs of turkey use (scat, foraging areas). We also have located potential sites opportunistically as part of other projects (bed mapping, pellet plots). Once identified, roosts were observed during dawn or dusk. Local site characteristics will be measured and used for wild turkey preferred habitat modeling for West TSA planning purposes.

**2008 work effort = 36 roost observations totaling 17 person days, 3 active roost sites identified in EM/DD TSA**

## ATTACHMENT C

### Forest Raptor Monitoring

**Objective:** Locate occupied nest sites and collect nesting success and productivity data and monitor impact of increased visitor use on raptor behavior at occupied nest sites.

**Methods:** For owl surveys, we sampled 11 stations three times each in suitable habitat by broadcasting calls of flammulated owls and great horned owls. For forest hawks, we censused the study area in 2007 by broadcasting raptor food-begging calls every 225 meters twice in forested habitat. We passively surveyed for northern goshawks in spring 2008 using dawn acoustical surveys (i.e., listening stations, no broadcasting).

**2008 work effort ~ 28 person days; We identified one Cooper's hawk breeding territory, 2 great horned owl breeding territories and 1 long eared owl breeding territory, but no northern goshawk or flammulated owl breeding territories.**

### Forest and Shrub-Nesting Songbird Monitoring

**Objective:** Augment existing baseline data on forest and shrub-nesting songbirds in the area as well as monitor the impacts of new trails on these communities.

**Methods:** Songbirds were passively surveyed using variable distance point counts (10 minute sampling period) at 34 listening stations throughout study area. Each station was surveyed three times from mid May to mid July. Listening stations were spaced at least 200 meters apart to maximize sampling effort. Some stations were established far from trails to act as controls, similar to the design of pellet plots.

**2008 work effort = 30 person days**



Open Space and Mountain Parks Visitor Master Plan  
 EM/DD Trail Study Area  
 Sustainable Recreation Monitoring Proposal  
**Public Comments and OSMP Response**

11/3/2008

**General**

<b>Public Comment/Issue</b>	<b>OSMP Response</b>
<p>OSMP Trail Guide volunteers might be a valuable resource to assist in the collection of monitoring data.</p> <p>Boulder Mountain Bike Patrol also collects data during regular volunteer patrols that may be useful for OSMP.</p> <p>How frequently will you monitor—is all this monitoring an on-going commitment indefinitely?</p>	<p><i>Staff will investigate the need and feasibility of using OSMP volunteers, including Trail Guides, to conduct monitoring.</i></p> <p><i>OSMP often receives calls and email messages describing the observations of community members and volunteers. Staff may use this information to inform decision-making.</i></p> <p><i>The Eldorado Mountain / Douvy Draw Trail Study Plan (EM/DD TSA) stated that staff would monitor up to two years to assess the effectiveness of on-trail and dog regulations, and to track the sustainability of equestrian travel on Goshawk Ridge Trail.. Decisions about the specific duration of monitoring will be based on the results of initial monitoring and the need to measure the effectiveness of OSMP's responses. Monitoring for undesignated trails and trail conditions will be incorporated into existing system-wide monitoring.</i></p> <p><i>Wildlife monitoring will occur over a longer time frame (up to 10 years). Staff will regularly evaluate the monitoring results for evidence of the presence of sensitive species and habitats that would benefit from immediate protection (e.g., seasonal closures or off-trail permit restrictions in areas around forest raptor nest sites).</i></p>

## Spring Brook Loop On-Trail and Dog Regulation Monitoring—Ranger Patrol & Contact

Public Comments	OSMP Response
<p>The compliance rates that are used must be consistent with previous OSMP documents</p> <p>How did OSMP come up with the thresholds?</p> <p>One out of every ten dogs off-leash is a lot (threshold is 90% compliance) compared to past levels of dog activity in the area.</p> <p>Compliance threshold for dogs on leash should be same as on-trail at 95%</p> <p>Are compliance rates related to resource impacts?</p> <p>Impacts have always driven the need for restrictions and the link between compliance and impacts must be made before restrictions are determined.</p> <p>Please don't close areas to use without revealing the study that provides scientific evidence as to why activities should be restricted.</p>	<p><i>The thresholds proposed by staff are consistent with previous policy direction. The numerical standards for compliance were recommended by staff and supported by the OSBT and City Council during the development of the Visitor Master Plan (VMP) and the EM / DD TSA Plan. The VMP proposed 95% and 90% compliance standards respectively for on-trail and dog control. The EM/DD TSA Plan recommends an 85-90% compliance standard for dog control. Staff recommended 90% for dog control, recognizing that the area dogs will be allowed is an area where dogs were previously not allowed.</i></p> <p><i>Additionally, the thresholds for regulatory compliance are not estimates of overall compliance, but rather indices of compliance that almost certainly overestimate the true rate of compliance.</i></p> <p><i>The thresholds proposed for visitor conflict monitoring were informed by a review of the best available information, including studies on visitor conflict and studies reported from peer agencies including Boulder County Parks and Open Space and Jefferson County Open Space.</i></p> <p><i>Yes, OSMP staff believes that compliance rates and resource impacts are related; however we do not understand the exact nature of the relationship. The Visitor Master Plan directs OSMP to consider the best available information and to use the least restrictive approaches possible to offer a high level of protection to natural resources.</i></p> <p><i>Delaying management actions until there is conclusive and significant effects upon natural resources would not be protective of the resource. By monitoring what we understand to be a source of stress to natural systems, OSMP can attempt to "head off" impacts.</i></p>

<b>Public Comments</b>	<b>OSMP Response</b>
<p>Clarify that existing regulations will stay in place even if we find acceptable levels of compliance.</p> <p>Instead of restricting an activity, increase enforcement of the rules already in place.</p> <p>Thresholds may be wrong (too high, too low)</p> <p>As monitoring results or data come in, consider integrating the data from various monitoring projects, including wildlife monitoring, and adjust thresholds as a response.</p> <p>The current level of ranger staffing will not be sufficient to make a significant presence on the trails.</p> <p>The effect of non-compliance varies with volume of visitor activity. A high rate of non-compliance by a small number of people may not be significant.</p>	<p><i>The regulations described in the VMP and EM/DD TSA Plan will remain in place even if measured compliance levels are above established thresholds</i></p> <p><i>Increasing enforcement was recommended as one of the least restrictive management responses.</i></p> <p><i>Staff sought guidance from the Visitor Master Plan (VMP) and the EM / DD TSA Plan for setting proposed thresholds and believe the thresholds are consistent with direction from the OSBT and City Council.</i></p> <p><i>OSMP may consider revisions to the initial thresholds. Any changes to established thresholds would likely go through a public review and comment process.</i></p> <p><i>Two seasonal ranger positions have been added. They will focus on monitoring and patrolling these new trails.</i></p> <p><i>OSMP is anticipating that the Spring Brook Loop will be a popular trail and rates of use will be significant. The monitoring will allow OSMP to develop compliance rates with specific activity types and determine relative levels of use by activity types</i></p> <p><i>Even low rates of non-compliant use can lead to resource impacts. The recreation ecology literature indicates that some of the most significant changes in resource condition result from cumulative effect of the initial disturbances. OSMP's experience is that visitation increases over time and even low rates of non-compliance by those engaged in a particular activity are likely to lead to significant cumulative effects.</i></p> <p><i>As information from wildlife and vegetation monitoring becomes available, OSMP will use it to select the most beneficial management response.</i></p> <p><i>See attached document: Trails Related Vegetation Monitoring</i></p>
<p>Integrate wildlife and vegetation consideration into the decision making process for the "most restrictive" options.</p>	

## Spring Brook Loop and Goshawk Ridge Undesignated Trail Monitoring

Public Comments	OSMP Response
<p>Rather than assuming all undesignated trails that develop should be closed, look at undesignated trails to determine if there is a reason for them. Do they go somewhere OSMP should be servicing?</p> <p>Allow for the possibility of modification to the existing trail(s) to meet an unsatisfied visitor desire such as providing a spur or minor reroute to incorporate an often visited overlook or resting spot.</p> <p>Make sure people know how to get to their destination using designated trails.</p>	<p><i>The TSA planning process identified the major trail developments for this area—including the designation or incorporation of existing social trails into new trails. Staff may modify the existing trail to include a minor reroute or spur trail to a popular overlook or resting spot if resource impacts are minimal and a physically sustainable trail possible.</i></p>
<p>The off-trail definition makes no provision for activities such as sitting by the side of the trail for a moment of rest, have a drink of water or to eat lunch.</p> <p>Relax or provide flexibility in the off-trail definition/regulation.</p>	<p><i>Maps at trailheads, clearly marked trails, and an area-specific brochure with a local trail map will be available. Rangers, outreach staff and volunteers will be present to assist and direct visitors.</i></p> <p><i>It is important to note, that although OSMP strongly encourages visitors to stay on trail, pedestrians are not required to do so on Spring Brook Loop. Visitors wishing to travel off trail in the Eldorado Mountain HCA (the area surrounding the Goshawk Ridge Trail) may do so if they obtain an Off-Trail Permit.</i></p> <p><i>OSMP's Monitoring staff will distinguish and record on and off trail travel on Spring Brook Loop using an unambiguous definition. Monitoring staff that observe visitors traveling off-trail will describe and categorize the reason for leaving the trail.</i></p> <p><i>Rangers will make determinations and allowances for incidental activities that reasonably occur near the trail. Staff proposed several exceptions to the off-trail definition including yielding to another visitor, avoiding obstacles, passing, and dogs incidentally stepping off the trail.</i></p>
<p>There is no way of relating a particular activity with the development of undesignated trails – no way to relate implications or responses to particular activities.</p>	<p><i>Staff recognizes that determining which activities contributed to the development of an undesignated trail may be difficult. Staff will use evidence such as foot prints, tracks, and dog/horse excrement to identify specific activities. If necessary, OSMP could also institute observational monitoring to determine if a particular activity is more responsible for an undesignated trail.</i></p>

<b>Public Comments</b>	<b>OSMP Response</b>
Why is Physical Sustainable monitoring not being prescribed for the Spring Brook Loop?	Trail condition monitoring which assesses the physical condition of trails is conducted on a system-wide and continuing basis. The new trails will be incorporated into the on-going trail management framework that links monitoring results with the prioritization of trail maintenance.

### Spring Brook Loop Visitor Conflict Monitoring

<b>Public Comments</b>	<b>OSMP Response</b>
Management responses should include modifications to trail design as they do for the other monitoring projects.	Trail modification is included in the recommended least restrictive management responses. Staff will clarify that trail modifications includes minor adjustments to the trail design.
Trails need to be designed to manage the user group with the highest potential speed.	Staff designs and constructs multiple use trails based on established trail standards for the activity which has the most significant physical requirements (i.e vehicle access, horse, wheel chair). Staff also considers additional trail design features that help the trail function well for all activities occurring on the trail.
Consider directional use as a least restrictive option even before opening the trails.	Staff is considering this option.
Temporal separation should be a “most restrictive” response—avoids creating second class citizens (bicyclists).	Staff believes that temporal separation is an appropriate “less restrictive” response and can be implemented fairly.
Include every activity (e.g., hiking) among those that could be prohibited under the “most restrictive” management response.	While all activities are subject to being prohibited, the city has made a significant investment in the development of the Spring Brook Loop trail system. OSMP considers it in the interest of all visitors to seek strategies that allow continued multiple use of the loop.
Survey data should be stratified by activity type.	The visitor conflict survey results will report the degree of conflict reported for each activity type. If a particular activity is causing visitor conflict above the threshold, then management actions will be directed to reduce the conflict associated with that particular activity. If visitors experience conflict above the threshold, but no particular group is contributing above the threshold, staff will work at lowering the conflict by working with all the activities involved in causing conflict.
Displacement of users will go undetected	The VMP and EM/DD Plan do not identify goals or thresholds for the relative composition of visitation by activity type at the trail, area or system level.
Establish a management goal that monitors the proportion of different activities	OSMP is aware of displacement as a potential problem and has included questions about

<p><b>Public Comments</b></p> <p>occurring and if the non-cyclist to cyclist ratio falls below a threshold (50%), investigate why.</p>	<p><b>OSMP Response</b></p> <p><i>displacement in a telephone survey of the community. In previous phone surveys, the dominant reasons for displacement were conflicts with dogs and bikes.</i></p> <p><i>Observational monitoring of regulatory compliance will allow OSMP to estimate the relative percent of visitation contributed by each activity type observed.</i></p>
--	--

### **Goshawk Ridge Sustainability of Equestrian Travel Monitoring**

<p><b>Public Comments</b></p> <p>Is the “two year” trial period for equestrian travel part of the TSA Plan?</p> <p>What exactly will determine if equestrian travel is “acceptable” or not and who gets to decide?</p>	<p><b>OSMP Response</b></p> <p><i>The EM/DD TSA Plan does include a trial period for equestrian travel for up to two years.</i></p> <p><i>Staff will use observable evidence such as hoof prints, horse excrement, and observations to identify off-trail travel by equestrians.</i></p>
--	--

### **Natural Resources Monitoring**

<p><b>Public Comments</b></p> <p>There has not been a discussion of acceptable range of variation for wildlife species. Have standards been developed for what is acceptable?</p> <p>What are the natural resource goals for the TSA?</p> <p>Nothing has been mentioned on vegetation monitoring.</p>	<p><b>OSMP Response</b></p> <p><i>Natural systems inherently possess considerable variation. Multiple seasons/years of wildlife monitoring may be required before staff understands the amount of natural variation within wildlife communities in EM/DD TSA. When natural variation can be estimated, staff will develop appropriate acceptable variation ranges.</i></p> <p><i>OSMP accomplished the goal of collecting pre-trail (i.e., current condition) data in 2007 &amp; 2008 and will continue wildlife monitoring in EM/DD TSA for 4 out of the next 5 years. This monitoring timeline will provide OSMP sufficient opportunity to estimate natural variation and assess trail impacts on wildlife.</i></p> <p><i>See attached document: Trails Related Vegetation Monitoring</i></p>
---	---

## Trails Related Vegetation Monitoring

11/04/08

OSMP approaches vegetation monitoring at two spatial scales; site-specific and system-wide. OSMP is interested in the effects of new trail construction on vegetation. The department has two site-specific vegetation monitoring projects underway designed to improve our understanding of these effects. These projects are staff time intensive and require long-term commitments. Consequently, OSMP establishes them very selectively. The EM/DD TSA Plan did not propose site-specific trail-effect vegetation monitoring for the area west of Doudy Draw.

OSMP also gathers system-wide baseline vegetation data to provide a better understanding of the distribution and abundance of plant associations and rare plant populations, and the condition—mostly weediness of these resources. This relatively inexpensive and comprehensive information helps staff place specific areas in context of their ecological importance and contribution to local and regional biodiversity and directs management action where it is most needed.

### Existing Monitoring and Inventory projects that will help inform trails planning:

**High Plains trail impact monitoring-** This is a site-specific monitoring effort set up prior to the construction of the High Plains trail. The project monitors 54 transects and 216 subplots at varying distances from the trail tread. The goal of the monitoring is to track changes in vegetation cover and composition due to the trail itself. The monitoring was stratified to cover a variety of vegetation and patch types. Due to the variety of vegetation covered by this study the impacts can be extrapolated out and applied to other similar areas of the system.

**Hwy 93 to Flatirons Vista connector trail visitor impact monitoring-** This site-specific monitoring project was contracted to Esco Associates from 2004-2007. It was designed to look at trail effects along the new Greenbelt connector trail. The study consisted of six transects at differing distances from the trail with the goal of measuring cover and composition of vegetation. The transects were placed in common vegetation types and the data can be extrapolated to other areas of the system.

**RAM weed mapping-** The rapid assessment weed mapping project is based on a widely used protocol adopted from Utah State University. This is a system-wide effort to quickly and consistently map weed species across OSMP. In 2008 staff focused on areas of the mountain backdrop including parts of the EM/DD TSA, and also mapped all designated and high use undesignated trails in the West TSA. This mapping gives staff comprehensive baseline weed information as well as a way to track changes in weed density, patch size and species occurrence. The trails specific data will inform where weed populations are changing along trail corridors and be used to inform treatment planning.

**Rare plant inventory-** OSMP keeps a system-wide database and GIS coverage of rare plant occurrences on the system. In 2007, staff began revisiting historic records and collecting data using a standard protocol for all occurrences. The goal is to revisit all populations of rare plants on a five-year cycle, adding new occurrences as they are discovered. For each occurrence record the species and location are recorded as well as information about the population size, habitat, and threats. Having a consistent inventory of rare plants allows OSMP to track population trends and plan new trails and reroutes away from sensitive plant species.

**Undesignated trail closure monitoring-** Social trail closure and restoration is often a regular part of new trail and reroute projects. The undesignated closure monitoring is designed to document restoration techniques, describe on-the-ground trail conditions, and track the success of management. Vegetation cover is one of the variables measured during this monitoring. Currently this monitoring is focused on the EM/DD area and covers a majority of the social trails in that TSA. Restoration work is ongoing and in conjunction with social trail mapping, vegetation staff will have data about how effective closures are and if and where new social trails are developing.