CHAPTER II – ALTERNATIVE DESCRIPTIONS

Introduction

This chapter describes the three alternatives considered by the Forest Service. The interdisciplinary team considered the following elements when developing the alternatives for this analysis: public scoping and internal review by the Forest Service; the purpose and need for this project; responsiveness to key issues as identified in Chapter 1; acts, regulations, policies, and plans governing land management on National Forest System lands; and site-specific resource information. An alternative comparison is displayed in Table 7 of this chapter.

The three alternatives analyzed in detail include:

- Alternative 1: Current Livestock Grazing Management
- Alternative 2: No Action - No Permitted Livestock Grazing
- Alternative 3: Adaptive Livestock Grazing Management (Forest Service Proposed Action)

Alternatives

Alternative 1: Current Livestock Grazing Management

The goal of this alternative would be to maintain current livestock grazing management requirements. The terms and conditions in the current Term Grazing Permit would remain the same until expiration.

With this alternative the Term Grazing Permit holders would be permitted to graze the following:

Table 4. Permitted livestock grazing under current management

<table>
<thead>
<tr>
<th>Allotment</th>
<th>Permit Type</th>
<th>Permitted Number of cow/calf pairs on % NFS land</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baldridge</td>
<td>Term</td>
<td>25 c/c</td>
<td>6/1-9/30</td>
</tr>
<tr>
<td>Cedar Creek</td>
<td>On/Off</td>
<td>22 c/c (64%)</td>
<td>7/1-9/1</td>
</tr>
<tr>
<td>Dunraven</td>
<td>On/Off</td>
<td>10 c/c (20%)</td>
<td>6/1-11/15</td>
</tr>
<tr>
<td>Stone Mountain</td>
<td>On/Off</td>
<td>5 c/c (36%)</td>
<td>7/1-9/30</td>
</tr>
<tr>
<td>Twin Sisters/Cabin Creek</td>
<td>On/Off</td>
<td>37 c/c (50%)</td>
<td>6/16-9/5</td>
</tr>
</tbody>
</table>

No additional range improvements would be required; current range improvements would be maintained by the permittee, as specified in the Term Grazing Permit. Minor adjustments to allotment management to adjust to resource conditions would be made through the Annual Operating Instructions, modification of the permit, or bill for collection.
Special terms and conditions are stated in all current permits (with the exception of Twin Sister/Cabin Creek) as follows:

- **Livestock Management**
  - Variation of on/off dates as described in Part I of this permit must be approved by the Forest Officer.
  - Permission for initial turn on to the allotment must be obtained by the Forest Officer at least five days in advance.
  - Salting locations must be at least ¼ mile away from water and at a minimum of 200’ from developed trails, roads, or other areas of concentrated public use.
  - Riding/herding should occur on a weekly basis at minimum and more if necessary, in order to relocate cattle to less desirable areas.
  - Dead livestock will be moved to a location greater than 200’ from water and out of view from roads, trails, or other areas of concentrated public use.
  - Bulls are to be included in the total permitted numbers, you must notify the forest officer if you plan to run bulls on the allotment (can be documented on the Annual Operating Provisions).

- **Rangeland Improvements**
  - Must gain approval by the Forest Officer before constructing or reconstructing and type of structure that will cause ground disturbance (e.g. excavation, fence or spring relocation, etc.).
  - All structural range improvements will be constructed and maintained to Forest Service specifications.
  - Range improvements must be functional before the livestock will be allowed to enter the allotment each year.
  - Failure to complete the assigned maintenance in a timely manner and to standard may be cause for actions to be taken against the grazing permit.

- **Monitoring**
  - Unless otherwise specified in the Annual Operating Instructions, please follow the utilization standards listed, which are as follows: utilization will not exceed on the average of 45% for uplands, an average minimum of 4 inches in satisfactory riparian vegetation, and an average minimum of 6 inches in unsatisfactory riparian vegetation. Assistance in conducting ocular utilization estimates or stubble height transects will be provided by the Forest Service upon request.

Special terms and conditions are stated in the Twin Sister/Cabin Creek permit as follows:

- **Management Practices include:**
1. Salting practices: Salt in timbered areas away from open meadows, near [away from] water and along roadways.
2. Livestock distribution: Check livestock at least bi-weekly and move livestock to other portions of the allotment to avoid overgrazing in any area.
3. Allowable Use Guidelines (Incorporated from the 1997 Revised Forest Plan): (Cattle will be removed from an area when the following guidelines are met, regardless of when it occurs in the season):
   ✓ Uplands – 45% of available forage is removed.
   ✓ Riparian Areas – 4 inch stubble height on sedges (Carex spp.) or 2 inch stubble height on Kentucky bluegrass, whichever occurs first.
   ✓ Woody Plants – 15-20% of current annual growth
   ✓ Streambank disturbance – Streambank disturbance from current year’s livestock grazing reaches 20-25% of the key area stream reach.
4. Report any noxious weed infestations you encounter on the allotment to the Forest Service as soon as possible.

All permittees would be responsible for following Weed Free Forage Products Order Number: R2-2005-01 (Appendix C). Allotment Management Plans based on current management would be developed to meet the intent of the Rescissions Act (PL 109-14) schedule for completion of allotment analysis.

Monitoring

Under Alternative 1, monitoring may involve annual inspections for Term Grazing Permit and Annual Operating Instruction compliance (on/off dates, improvement maintenance, movement/distribution of livestock, etc.), range readiness, and range resource trend. However, under the current Term Grazing Permit, the ability to change livestock grazing management as a result of monitoring is limited. Minor management adjustments could be made, by exception, in the Annual Operating Instructions. Changes that cannot be done through the Annual Operating Instructions or permit modifications may require new NEPA analysis.

Alternative 2: No Action - No Permitted Livestock Grazing

The Council for Environmental Quality Regulations (40 Code of Federal Regulations §1500-1508) for implementing the NEPA requires that a no action alternative be developed as a benchmark from which the agency can evaluate the proposed action. No action in livestock management planning is defined as no permitted livestock grazing (USDA Forest Service 1996⁶; Forest Service Handbook 2209.13⁷). The decision to authorize livestock grazing has been found

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by the courts to be a discretionary action that must be evaluated under the NEPA (except as otherwise provided by the Rescissions Act of 1995 and other related legislation).

Alternative 2 would discontinue livestock grazing on the Thompson Grazing Allotments. This decision would stand unless a subsequent NEPA-based decision was reached to allow for re-stocking or permanent closure. A “No Action – No Permitted Livestock Grazing” alternative is considered in detail to compare, relative to livestock grazing alternatives, the environmental consequences of taking action to cease livestock grazing on the allotment. In addition, it is considered to be a viable alternative that is capable of responding to issues and the purpose and need.

Under the No Action alternative, livestock grazing would no longer be authorized on the allotments; therefore, the existing Term Grazing Permits would be cancelled. The permittee may be given a one year phase-out period to adjust his operations during which time the permittee would be authorized to graze the allotment while the cancellation process proceeds (following 36 Code of Federal Regulation 222.4(a)(8) and Forest Service Handbook 2209.13, Sections 16.1, 16.3). During that timeframe, livestock grazing would continue to follow the Term Grazing Permit terms and conditions and Annual Operating Instructions as provided for in Alternative 1.

After one year, construction/reconstruction of range improvements (internal drift fences and water developments) would no longer occur. Range improvement structures may be removed, assigned for maintenance to other resource areas (such as wildlife), or allowed to deteriorate depending on site-specific evaluation of their values for other uses.

Monitoring

Under Alternative 2, allotment monitoring would involve periodic inspections for permit compliance and utilization standards during the one year phase-out period, if necessary (as time and priority allow); and periodic inspections for unauthorized livestock grazing after the one year phase-out period.

Alternative 3: Adaptive Livestock Grazing Management (Proposed Action)

Alternative 3, also referred to as the proposed action, has been developed to meet the purpose and need for action as described in Chapter 1. The proposed action has been designed to respond to the key issues. Alternative 3 is expected to result in improved riparian conditions, compliance with standards and guidelines for the North St. Vrain Research Natural Area and Core Habitats management area on the Twin Sisters/Cabin Creek Allotment, changes in allotment boundaries to reflect actual livestock grazing management areas (Figure 3), and promote satisfactory rangeland conditions for long-term sustainability and future livestock grazing. Implementation of this alternative would be through re-issuance of Term Grazing Permits and updating of the Allotment Management Plans, both of which would implement the decision made in the Decision Notice and Finding of No Significant Impact.

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This alternative is based on the principle of adaptive management, a process that uses focused monitoring information to determine if management is meeting or making satisfactory movement toward desired conditions, or if changes are needed to meet or move existing resource conditions toward desired conditions. Adaptive management is a process that allows the Forest Service to manage for changing conditions and new information over time. It gives the authorized officer the flexibility to adapt to change within the constraints imposed by the EA and subsequent decision. As long as implementation continues to remain within the scope of the EA, the District Ranger may choose to implement adaptive changes. If a needed change has not been evaluated within this EA, additional NEPA analysis and decisions may be necessary.

Implementation of this alternative requires selecting a set of design criteria and adaptive management practices that would best meet or effectively lead to the desired conditions as outlined in Chapter 1, Table 2. Monitoring would occur over time, and the Forest Service would make appropriate adjustments in management practices (design criteria), as needed, to ensure adequate progress toward desired conditions. All adaptive management options available would be analyzed under this EA and adopted for potential future use. The proposed action would implement the following design criteria, and adaptive management options if needed, on the Thompson Area Grazing Allotments and would be incorporated into new Term Grazing Permits and Allotment Management Plans.

In the planning and implementation of management activities, the Forest Service uses many design criteria to reduce or prevent negative impacts on the environment. The application of these design criteria begins at the planning and design phase of a project. The Forest Plan standards and guidelines, the direction contained in the Watershed Conservation Practices Handbook\(^9\), and specific items to be incorporated into the permit are identified below. All applicable direction from these two sources is incorporated by reference and can be found in Appendix A. Other specific design criteria were developed by the interdisciplinary team to respond to identified issues and management needs.

The design criteria below have been used on this Forest or are commonly used practices, as supported by practical experience and best available science, throughout the West and have been found to be effective in reducing and managing potential livestock grazing impacts. References below to “permittee” include the Term Grazing Permit holder, agent, herder, rider, or employee. References below to “permitted livestock” apply to animals authorized under a Grazing Permit and are not intended to refer to recreation livestock, animals authorized under special use permits, or outfitter-and-guide livestock.

**Design Criteria Common to All Allotments:**
- Livestock grazing, on average, would occur from spring through fall, seldom occurring before May 15 or later than October 31. Annual climatic fluctuations and/or changes in vegetative condition (such as by fire, flood, or hail) may result in an annual modification of authorized numbers, animal class, and/or seasons of use, within the authorized stocking rate.

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Livestock would be intensively managed in order to meet site-specific requirements as follows:

- In selected “functional-at-risk” stream reaches, there would be at least six inches of stubble height on tall sedges at the end of each grazing season, or at the end of the growing season, whichever is later. Key areas are identified in Table 5. In key riparian areas that are “properly functioning,” there would be at least four inches of stubble height on tall sedges at the end of each grazing season, or at the end of the growing season, whichever is later.
  - Allowable utilization on satisfactory rangelands would be 45%.

- Livestock would be moved to another area/pasture or removed from the allotment if allowable use design criteria are met at any time during the grazing season on any key area of the allotment.

- Livestock would be removed from the allotment at the end of the authorized grazing season or as determined by the Forest Service to meet resource needs.

- Livestock would be authorized to enter the allotment as resource conditions and vegetative growth (range readiness) allow, ensuring that soil conditions are dry enough to withstand livestock use.
  - At least five days prior to turn-out on the allotment, the permittee would contact the Forest Service to verify that the range is ready for livestock grazing and all required maintenance has been performed to standard.

- Riding/herding would be used to improve distribution across the allotment. Permittee would ride and/or herd cattle as much as necessary. At a minimum, this would be done weekly to move livestock away from concern areas (riparian areas, key areas) and into areas of normally light use. The permittee would provide completed logs showing riding and/or herding to the Forest Officer at the end of each grazing season.
  - Permittee is encouraged to use low-stress livestock handling practices when herding cattle on the allotment (Appendix B).

- Salt and supplement would be used to encourage livestock to use secondary range and assist in improving distribution across the allotment.
  - Salt and supplement (e.g. low-moisture blocks) would be used and placed on rocky knolls, well-drained sites or in timber where trampling will not impact plant growth.
  - As utilization patterns develop, salt and supplement would be moved to areas where forage has not been grazed, or where it has been grazed lightly to draw livestock toward or away from specific areas.
  - In no case would salt or supplement be placed within ¼ mile of riparian areas, live water, developed water resources, or key areas, without specific prior approval by the Forest Officer.

- Permittee is responsible for maintaining fences and water developments to standard and timeliness as stated in the Term Grazing Permit and Allotment Management Plan.

- Permittee is responsible for following Weed Free Forage Products Order Number: R2-2005-01 (Appendix C).
  - Before hay or straw is used on the permitted area, it must be approved by the Forest Officer, and be certified noxious weed-free or noxious weed-seed-free, or shall consist of heat treated pelletized feeds.
If livestock are moving onto National Forest System lands from areas containing infestations of noxious weeds, provide noxious weed-free feed to livestock for several days prior to moving them onto the allotment to reduce the introduction of new invaders and spread of existing noxious weed species. Consider using transitional pastures when moving animals from noxious weed infested areas to National Forest System lands.

- Reduce ground disturbance where necessary by considering changes in the timing, intensity, duration or frequency of livestock use; location and changes in salt grounds; restoration or protection of watering sites; and restoration of yarding/loafing areas, corrals, and other areas of concentrated livestock use.

- Any seed used on the allotment will be tested for “all states noxious weeds” according to Association of Official Seed Analysts (AOSA) standards and will be certified by a Registered Seed Technologist or Seed Analyst as meeting the requirements of the Federal Seed Act (7 U.S.C. Chapter 37: Sections 1551-1611) and the Rules and Regulations of the Colorado Seed Act pursuant to 35-27-101 through 125, C.R.S. (1993 Supp. as amended by Senate Bill 93-17).

- For more information on weed-free forage and links to noxious weed information for the state of Colorado, see the following link: http://www.ag.state.co.us/dpi/WeedFreeForage

- Dead livestock would be moved to a location greater than 200 feet from water, out of view of roads and trails, and away from any areas of public use.

- The permittee must carry out the Term Grazing Permit provisions, other instructions, or both as issued by the Forest Officer for the allotment and require employees, agents, contractors, sub-contractors to do likewise (Forest Service Handbook 2209.13 and Term Grazing Permit, Part 1 - Section 3 and Part 2 - Section 8 (a-h)).

- Allotment boundaries would be adjusted to reflect actual livestock grazing management areas between National Forest System lands and intermingled private lands. The permittee would manage permitted livestock within the new allotment boundaries (Figure 3).

- Any Threatened, Endangered, Sensitive, or Proposed species or other plant species of local concern found within the Thompson Area Grazing Allotments prior to or during project implementation may be excluded from grazing to remove or reduce adverse impacts to occurrences. These protective measures may be included in the Allotment Management Plans.

- If undetected fens, wetlands, or wet meadows are encountered within the Thompson Area Grazing Allotments, consultation with a botanist would occur immediately to mitigate impacts to the sensitive area, and/or to monitor for future grazing impacts if none are currently occurring.

- Sites proposed for new water developments, fences, or other ground disturbing activities would be surveyed by a botanist or botany technicians prior to construction to determine the presence of Threatened, Endangered, Sensitive, or Proposed or rare plant species. If target species are found, the botanist will coordinate with range management staff in order to avoid or minimize impacts to sensitive or rare plants.

- If sensitive amphibian habitat (i.e. breeding sites) is detected within the Thompson Area Allotments, an assessment of grazing impacts would be conducted and actions to maintain and protect the habitat would be taken, if deemed necessary. These may
include: restricting livestock use from the area by herding, or fencing the breeding site to exclude grazing use.

- Sites proposed for new water developments, fences, or other ground disturbing activities will be surveyed by an archaeologist to determine the presence of cultural resources. If significant cultural resources are found, the archaeologist would coordinate with range management staff to move the location of the development in order to avoid or minimize impacts to cultural resources.

Based on monitoring results occurring over time, the Forest Service would make appropriate adjustments in management practices (design criteria), as needed, to ensure adequate progress toward desired conditions. When design criteria management is not adequate in meeting or moving toward the desired resource conditions, then the following adaptive management options would be used either alone or in combination to best meet, or move toward the desired resource conditions within an overall timeframe of ten years (life of Term Grazing Permit). The Forest Officer would decide which adaptive management option to implement.

**Adaptive Management Options Common to All Allotments:**

- After three to five years, if monitoring results indicate that resource conditions are either not meeting, or exceeding, desired resource conditions then modify the number of animals and/or the season of use as reflected in the Annual Operating Instructions and/or Term Grazing Permit, as needed.

- Additional adaptive management options to be implemented as needed:
  - Incorporate supplementary riding/herding from riparian areas.
  - Defer livestock turn-on date.
  - Rest from livestock grazing for one or more seasons.
  - Control livestock distribution patterns by constructing temporary electric fence.
  - Control livestock distribution patterns by constructing permanent fence (e.g. cross fence).
  - Construct fence to exclude livestock from areas of concern.
  - Reconstruct existing non-operational fence line.
  - Implement a different or modified grazing system (deferred, rest-rotation, etc.).
  - Implemet multiple unit rotation with permittee’s private land.

- If the permittee voluntarily decides to waive the permit, then the allotment could remain vacant or become a forage reserve allotment.

**Design Criteria and Adaptive Management Options Specific to Each Allotment:**

In addition to the design criteria and adaptive management options common to all allotments as described above, the following design criteria and adaptive management options specific to each allotment would also apply.

**Baldridge Allotment:** Livestock grazing would be managed to maintain the current satisfactory rangeland conditions for long-term sustainability and future livestock grazing.

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Design Criteria specific to Baldridge Allotment:
- Permitted numbers would reflect average or normal use of 25 head for 4 months, but a change in authorized numbers, animal class, and/or seasons of use may occur annually due to annual climatic fluctuations and/or changes in vegetative condition (such as by fire, flood, or hail).

Adaptive Management Options specific to Baldridge Allotment:
- If monitoring indicates that riparian or rangeland resources are not meeting or moving towards desired conditions in key areas, then:
  - Work with permittee to determine appropriate management or mitigations.

Cedar Creek Allotment: Livestock grazing would be managed to reduce impacts to riparian areas along Cedar Creek and Jug Gulch, to improve potential Preble’s habitat and other riparian associated species, to better utilize upland vegetation in the Bobcat burn areas, and to promote satisfactory rangeland conditions for long-term sustainability and future livestock grazing.

Design Criteria specific to Cedar Creek Allotment:
- Permitted numbers would reflect average or normal use of 35 head for 2 months on 63% National Forest System lands, but a change in authorized numbers, animal class, and/or seasons of use may occur annually due to annual climatic fluctuations and/or changes in vegetative condition (such as by fire, flood, or hail).
- Identify and develop one or two new water sources in the following areas:
  - Dry Creek: NE corner of Sec 19.
  - South Cedar Creek location (NE4 Sec 31 near sawmill).
- In no case would salt or supplement be placed within ¼ mile of Cedar Creek.

Adaptive Management Options specific to Cedar Creek Allotment:
- After three to five years, if monitoring results indicate that improved watershed conditions are not occurring along Cedar Creek and Jug Gulch (i.e. riparian conditions should be more similar to those downstream of Cow Camp), then:
  - Implement watershed improvement projects, including strategic fence locations, to accelerate riparian condition recovery in Cedar Creek.
- If monitoring indicates that livestock distribution is still not adequate, identify and develop one additional water source as needed to aid in livestock distribution.

Dunraven Allotment: Livestock grazing would be managed to reduce impacts to watershed conditions in draws and intermittent drainages, to improve potential Preble’s habitat, and to promote satisfactory rangeland conditions for long-term sustainability and future livestock grazing.

Design Criteria specific to Dunraven Allotment:
- Permitted numbers would reflect average or normal use of 24 head for 4.8 months on 48% National Forest System lands, but a change in authorized numbers, animal class,

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11 Water sources not shown on Figure 3 as a final determination on number and location has not been made.
and/or seasons of use may occur annually due to annual climatic fluctuations and/or changes in vegetative condition (such as by fire, flood, or hail).

- Identify and develop one new water source in the following potential areas:
  - On NFS lands: NE4 Sec 36; or
  - On NFS lands or private land: main drainage in Sec 31; or
  - On NFS lands or private land: SW4 Sec 32 drainage; or
  - On private land within the allotment as determined by the permittee; such as SW4 Sec 25, or N2 Sec 31, or tank in drainage SW4 Sec 33.

- Construct drift fence on SE corner of allotment to better utilize uplands in Section 4.
- Construct one exclosure in an intermittent tributary as a study area to monitor recovery. Changes will be monitored in the fenced area as compared to the non-fenced area and then determined what changes are needed in the non-fenced area after one to three years.

- **Adaptive Management Options specific to Dunraven Allotment:**
  - After three years, if monitoring results indicate that improved watershed conditions are not occurring (i.e. more riparian vegetation in wet areas and on the banks of creeks in drainages):
    - Change the number of animals and/or the season of use as reflected in the Annual Operating Instructions and/or Term Grazing Permit:
      - If allowable use guidelines are not met in two out of three years, then reduce the number of animals and/or the season of use by at least 15%. Based on monitoring results and resource concerns at that time, it may be necessary to reduce the number of animals and/or the season of use by more than 15%.
    - Identify and develop an additional water source in one of the areas described above:
      - If an adequate location is found that would be effective in improving livestock distribution, then this option may be implemented in lieu of a reduction in the number of animals and/or the season of use.
    - Implement watershed improvement projects to accelerate recovery in drainages.
    - Repair/rebuild cross-fence in Sec 31 to control east-west movement.

**Stone Mountain Allotment:** Livestock grazing would be managed to maintain the current satisfactory rangeland conditions for long-term sustainability.

**Design Criteria specific to Stone Mountain Allotment:**
- Permitted numbers would reflect average or normal use of 5 head for 3 months on 36% National Forest System lands, but a change in authorized numbers, animal class, and/or seasons of use may occur annually due to annual climatic fluctuations and/or changes in vegetative condition (such as by fire, flood, or hail).

- **Adaptive Management Options specific to Stone Mountain Allotment:**

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12 Water sources not shown on Figure 3 as a final determination on number and location has not been made.
If monitoring indicates that riparian or rangeland resources are not meeting or moving towards desired conditions, then
- Work with permittee to determine appropriate management or mitigations.

**Twin Sisters / Cabin Creek Allotment:** Livestock grazing would be managed to comply with Management Area direction for the St. Vrain Research Natural Area and Core Habitat standards and guidelines south of Johnny Park Road on National Forest System lands; and to promote satisfactory rangeland conditions for long-term sustainability and future livestock grazing.

**Design Criteria specific to Twin Sisters / Cabin Creek Allotment:**
- Permitted numbers would reflect average or normal use of 36 head for 2.7 months on 90% National Forest System lands, but a change in authorized numbers, animal class, and/or seasons of use may occur annually due to annual climatic fluctuations and/or changes in vegetative condition (such as by fire, flood, or hail).
- Use best management practices to minimize and limit livestock grazing south of Johnny Park Road on National Forest System lands to comply with Management Area direction for Research Natural Area and Core Habitat management areas:
  - Non-motorized weekly herding would be required south of Johnny Park Road to move livestock north of Johnny Park Road.
  - In no case would salt or supplement be placed south of Johnny Park Road.
  - Salt and supplement would be used to encourage livestock to use the northern part of the allotment.
  - Turnout livestock north of House Rock at the beginning of the season, when feasible or when determined by the Annual Operating Instructions.
- Conduct botany surveys south of Johnny Park Road on National Forest System lands managed by the Boulder Ranger District during the appropriate growing season for the target plant species in 2009, focusing primarily on two areas: the aspen grove and adjacent meadow and creek located near the boundary between National Forest and private land, which provide habitat for several sensitive and rare plant species; and the south side of Deer Ridge in the Research Natural Area, where several rare plant communities are located.

**Adaptive Management Options specific to Twin Sisters / Cabin Creek Allotment:**
- After three to five years, if monitoring results indicate livestock grazing is not being limited or minimized south of Johnny Park Road in the Research Natural Area, then identify strategic location and construct a drift fence to discourage livestock grazing in the Research Natural Area.
- After three to five years, if monitoring results indicate increased livestock grazing north of House Rock is adversely impacting riparian areas, then:
  - Identify and develop an additional water source in Section 19, 20, or 30 north of House Rock to improve distribution and encourage use away from the Pierson Park meadow.
Monitoring

Under Alternative 3, monitoring provides the Forest Officer with the rationale and flexibility to adapt livestock grazing management to changing conditions. If monitoring results indicate concerns with meeting design criteria or in meeting or moving toward desired conditions, adjustments would be made using one or more of the livestock grazing management adaptive options as described above.

Monitoring includes both Forest-level and project-level analysis and evaluation. Forest-level monitoring is discussed at length in Chapter IV of the Forest Plan and is not reiterated here. Project-level monitoring is the focus of this section of the EA.

Monitoring is intended to be rapid, practical, cost-effective, answer specific questions, and to affect on the ground management. Monitoring techniques are designed to be commensurate with the level of livestock grazing use and the complexity of the overall analysis area situation. The techniques and protocols listed in the Rangeland Analysis and Management Training Guide\(^6\) and Watershed Conservation Practices Handbook\(^9\) would be used as the basis for monitoring vegetation.

Monitoring at the allotment scale is used for the following:

- Determining the effectiveness of management practices.
- Determining compliance with the Term Grazing Permit and Annual Operating Instructions.
- Determining whether a site is meeting, moving toward, or away from desired conditions.
- Documenting rangeland condition.
- Affecting management decisions within an adaptive management framework (i.e. determining when threshold levels have been met or exceeded prompting management action).
- Increasing the accuracy of livestock grazing capacity estimates.
- Determining the effects of livestock grazing on natural resources.

Benchmark and key areas are relatively small parts of the analysis area that can represent much larger areas. Benchmark areas are the sites where long-term or effectiveness monitoring occurs. Key areas are those areas where short-term or implementation monitoring occurs. Key areas are monitored annually to determine when a threshold (such as allowable use) has been reached. Benchmark and key areas can change, as needed, depending on such factors as annual weather fluctuations or past permittee compliance history. The areas chosen are representative locations that are sensitive to management changes and can be used to make management decisions for a much larger area, typically located in an area of concern (for all resources) to the Forest Service, where cattle utilization occurs and future management decisions can be developed. See Table 5 for locations of benchmark and key areas.

A number of attributes may be monitored. Attributes may be related to vegetation, hydrology, riparian zones, or desired condition; or they may be specific plant or animal species surveys.
Examples of vegetative attributes that may be monitored include herbaceous production, cover, frequency, and species composition. Examples of riparian or hydrological attributes that may be monitored include proper functioning condition, width-to-depth ratio, bank stability, channel cross section, greenline, water quality, erosion, and sediment load.

Two basic types of monitoring are expected to occur in the analysis area: 1) implementation monitoring, and 2) effectiveness monitoring, which are discussed in more detail below.

**Implementation (Short-Term) Monitoring**

Implementation monitoring is short-term monitoring (annual or as needed) to evaluate whether livestock management is being applied as prescribed. The Forest Service, with assistance and cooperation from the permit holder, would conduct this type of monitoring through inspections of the analysis area to evaluate whether livestock management is in compliance with Annual Operating Instructions and the Term Grazing Permit. The Term Grazing Permit includes Forest Plan standards and guidelines, the Allotment Management Plan, and design criteria (described in the proposed action – Alternative 3).

The Forest Service may vary the frequency of inspections on a case-by-case basis, including, but not limited to, annual weather fluctuations, past permittee compliance history, and changes in current resource and/or social issues. Implementation monitoring is intended to provide the Forest Officer with a record of where problems occur or when standards have been met, to make livestock grazing management changes if necessary.

Key areas would be used to inspect relatively small parts of the analysis area and then extrapolated to represent much larger areas. Key areas would be used as monitoring sites for design criteria such as allowable use and other general observations. Forest Service inspections of the allotment would check for compliance with the requirements listed in the Annual Operating Instructions and the Term Grazing Permit. Noncompliance concerns would be brought to the attention of the permittee and the responsible official for resolution.

Table 6 displays implementation monitoring in more detail.

**Effectiveness (Long-term) Monitoring**

Effectiveness monitoring focuses on long-term trends for the following: 1) overall permittee compliance, 2) meeting or moving toward Forest Plan standards and guidelines, 3) meeting or moving toward project-specific desired conditions, and 4) stocking levels are appropriate relative to other resource values.

Effectiveness monitoring determines whether the analysis area is meeting or moving toward desired conditions, and if the rate of change is acceptable (within the scope of this analysis). The rate of acceptable change is determined by the Forest Officer unless expressly directed otherwise in the Forest Plan or this document. If monitoring shows that Forest Plan or project-specific desired conditions are not being met, the District Ranger would review the situation to determine an appropriate course of action to change management to improve conditions.
The following benchmark and key areas would be established on the Thompson Area Grazing Allotments and used as monitoring sites for collecting short and longer-term resource data; and would focus on concern areas as well as representative areas (see also Figure 4).

Table 5. Key and benchmark areas for the Thompson Area Grazing Allotments

<table>
<thead>
<tr>
<th>Allotment</th>
<th>Key Areas</th>
<th>Benchmark Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baldridge</td>
<td>Nelson Spring area.</td>
<td>None identified at this time.</td>
</tr>
<tr>
<td>Cedar Creek</td>
<td>1. Cedar Creek north of FSR 102 (SE4 Sec 24).</td>
<td>1. Cedar Creek north of FSR 102 (SE4 Sec 24).</td>
</tr>
<tr>
<td></td>
<td>2. Dry Gulch drainage: NE4 Sec 19.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Near cages in NW4 Sec 30.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Center E2 Sec 31, first tributary west of corral.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Sec 36, northern center boundary.</td>
<td></td>
</tr>
<tr>
<td>Stone Mountain</td>
<td>NE4NE4 Sec 19.</td>
<td>None needed.</td>
</tr>
<tr>
<td>Twin Sisters /</td>
<td>1. Meadow: SW4 Sec. 6.</td>
<td></td>
</tr>
<tr>
<td>Cabin Creek</td>
<td>2. Core Habitat MA: creek/aspen grove/meadow (NW4 Sec 18, corner of NFS land and private).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. RNA: meadow (FDR 604, SE4 Sec 13).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Meadow: Pierson Park (SE4 Sec 19) and/or other wet meadows along Pierson Park Road between Sec 18/17 as field verified based on utilization/resource concerns.</td>
<td></td>
</tr>
</tbody>
</table>

The following table displays planned monitoring in more detail. In addition, any of the monitoring techniques from the Rangeland Analysis and Management Training Guide (or other established techniques) may also be used alone or in combination. As new techniques become available, they may also be incorporated as a monitoring method.
Table 6. Monitoring (short-term and long-term)

<table>
<thead>
<tr>
<th>IMPLEMENTATION (SHORT-TERM) MONITORING*</th>
<th>Frequency</th>
<th>By Whom</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring Item</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Allotments Permit and Annual Operating Instruction Compliance (on/off dates, improvement maintenance, movement/distribution of livestock, etc.)</td>
<td>Annually</td>
<td>Forest Service – Range</td>
<td>Permittee compliance with terms and conditions of Term Grazing Permit.</td>
</tr>
<tr>
<td>All Allotments, except Stone Mountain Range Readiness</td>
<td>Annually on a landscape basis</td>
<td>Forest Service – Range; and/or Permittee</td>
<td>Minimize impacts to allow for: - improved riparian conditions. - satisfactory rangeland conditions.</td>
</tr>
<tr>
<td>All Allotments, except Stone Mountain Allowable use guidelines</td>
<td>Annually or more/less frequently depending on resource concerns</td>
<td>Forest Service – Range; and Permittee</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EFFECTIVENESS (LONG-TERM) MONITORING*</th>
<th>Frequency</th>
<th>By Whom</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring Item</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cedar Creek, Dunraven, Twin Sisters/Cabin Creek Range Resource Trend: Cover-Frequency Transect</td>
<td>Once within 3 years of this analysis, another in conjunction with next analysis</td>
<td>Forest Service – Range</td>
<td>Trends are meeting or are moving towards satisfactory range condition within 5-10 years of this project decision.</td>
</tr>
<tr>
<td>Cedar Creek, Dunraven Riparian/Aquatic Resource Trend: Proper Functioning Condition</td>
<td>Once within 5 years of this analysis, another in conjunction with next analysis</td>
<td>Forest Service – Watershed, Fisheries, and/or Range</td>
<td>Improve trend in riparian resource and aquatic habitat conditions within 10 years.</td>
</tr>
<tr>
<td>Location</td>
<td>Habitat Trend:</td>
<td>Monitoring Frequency</td>
<td>Responsible Agency</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------</td>
<td>---------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Cedar Creek, Dunraven</td>
<td>Preble’s/riparian Habitat Trend: Visual inspection with photopoints</td>
<td>Twice within the first 5 years, and a third time in years 6-10 after analysis / permit reauthorization</td>
<td>Forest Service - Wildlife</td>
</tr>
<tr>
<td>Twin Sisters / Cabin Creek</td>
<td>Meadow/riparian habitat Trend: (north of House Rock) – Visual inspection, establish and monitor photopoints</td>
<td>Twice within the first 5 years, and a third time in years 6-10 after analysis / permit reauthorization</td>
<td>Forest Service – Wildlife and Watershed, and/or Range</td>
</tr>
</tbody>
</table>

*Note: For more specific monitoring criteria for Dunraven, see “Adaptive Management Options specific to Dunraven Allotment” section above.*
Figure 3. Alternative 3 Map
Figure 4. Key and Benchmark Areas Map
Comparison of Alternatives

The following table provides a summary of the alternatives in comparative form. This table shows the difference between alternatives and provides information necessary to make an informed decision.

Table 7. Alternative comparison table

<table>
<thead>
<tr>
<th>KEY ISSUE</th>
<th>ALTERNATIVE 1</th>
<th>ALTERNATIVE 2</th>
<th>ALTERNATIVE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riparian Conditions</td>
<td>Partially responds to the issue, limited improvement in riparian conditions.</td>
<td>Fully responds to the issue.</td>
<td>Fully responds to the issue, adaptive management allows for the flexibility to adjust management and reduce impacts to riparian conditions in the long term.</td>
</tr>
<tr>
<td>Stream reaches and associated riparian areas in proper functioning condition.</td>
<td>Riparian condition would be expected to improve less with Alt. 1 than with the other alternatives. Tools such as range readiness and utilization standards could be used to limit riparian impacts.</td>
<td>Livestock grazing would no longer impact riparian conditions. Condition of all riparian areas would be expected to improve, subject to other resource uses and impacts.</td>
<td>Condition of all riparian areas would be expected to improve over time with Alt. 3.</td>
</tr>
<tr>
<td>Time of recovery</td>
<td>Riparian condition would be expected to improve more slowly with Alt. 1 than with the other alternatives.</td>
<td>Riparian condition would be expected to improve more quickly with Alt. 2 than with the other alternatives.</td>
<td>Riparian condition would be expected to improve more quickly than Alt. 1 and slower than Alt. 2.</td>
</tr>
<tr>
<td>Flexibility in livestock grazing management in response to changing conditions.</td>
<td>Alt. 1 would be the least flexible in response to changing or unanticipated resource conditions during the timeframe of a Term Grazing Permit.</td>
<td>Flexibility in livestock grazing management would no longer be applicable with Alt. 2.</td>
<td>Alt. 3 would be the most flexible in response to changing or unanticipated resource conditions during the timeframe of a Term Grazing Permit.</td>
</tr>
<tr>
<td>North St. Vrain Research Natural Area/Core Habitat Management Areas</td>
<td>Does not respond to the issue.</td>
<td>Fully responds to the issue.</td>
<td>Fully responds to the issue.</td>
</tr>
<tr>
<td>Twin Sisters/Cabin Creek (south of the Johnny Park Road on National Forest System lands): North St. Vrain Research Natural Area and Core Habitat management area standards and guidelines require special consideration with respect to livestock grazing and motorized use.</td>
<td>In Alt. 1 there is no permit management in place to limit livestock grazing or prohibit motorized permittee administration in these areas.</td>
<td>In Alt 2. no livestock grazing complies with management area standards and guidelines of limited livestock grazing. Motorized administration in these areas related to livestock grazing would be unnecessary.</td>
<td>In Alt. 3 adaptive management allows for the flexibility to adjust management to comply with Management Area standards and guidelines.</td>
</tr>
</tbody>
</table>
### Alternatives Considered but Eliminated from Detailed Analysis

All reasonable alternatives developed by the interdisciplinary team or derived from public comments were analyzed in detail. No alternatives were dismissed from detailed study.

<table>
<thead>
<tr>
<th>KEY ISSUE</th>
<th>ALTERNATIVE 1</th>
<th>ALTERNATIVE 2</th>
<th>ALTERNATIVE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allotment Boundaries</td>
<td>Does not respond to issue.</td>
<td>Does not respond to issue.</td>
<td>Fully responds to issue.</td>
</tr>
<tr>
<td>Allotment boundary and Term Grazing Permit reflects the area actually utilized or managed.</td>
<td>Alt. 1 does not reflect current allotment boundary or Term Grazing Permit situations.</td>
<td>No action would be needed to update the boundary once the permit is cancelled with Alt. 2.</td>
<td>Alt. 3 provides for allotment boundary and Term Grazing Permit changes to better fit with actual management.</td>
</tr>
</tbody>
</table>