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Environmental Assessment

Magnolia Non-Motorized Trails

Boulder Ranger District
Roosevelt National Forest
Boulder and Gilpin Counties, Colorado

T. 1S, R. 73 W, sections 13, 23, 24, 26, 27, 34, 35, 36
T. 1S, R. 72 W, sections 9, 10, 15-21



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DEFINITIONS OF SOME TERMS

CFR: Code of Federal Regulations

Forest Plan Goals: describes desired end-results and are normally expressed in broad, general terms.

Forest Plan Standards: defined as courses of action or levels of attainment required to achieve goals and objectives. Standards are mandatory and deviation from them is not permissible without an amendment to the *Forest Plan*.

Forest Plan Guidelines: defined as preferred or advisable courses of action or levels of attainment designed to achieve the goals and objectives. When deviation from a guideline is necessary, it will be documented during the project-level analysis.

FSH: Forest Service Handbook

FSM: Forest Service Manual

Invasive Plants – Noxious Weeds: Invasive Plants can be thought of as a broader term for noxious weeds. Noxious weeds are the plants that are actually listed by the state and/or by the US Fish and Wildlife Service and federally by the USDA, Animal and Plant Health Inspection Service.

Lynx Analysis Unit: An area approximating the size of the home range of a female lynx

National Forest System (NFS): pertaining to lands on National Forests

National Forest System Road or System Road: Any officially designated and authorized National Forest Service Road (NFSR).

National Forest System Trail or System Trail: Any officially designated and authorized National Forest Service Trail (NFST).

Non-system Trail/Social Trail/User-created Trail: Unplanned/unauthorized trails/paths/routes that developed informally from use and are not designated or maintained as a NFST. This is a trail that the US Forest Service did not design or construct. Rather individual users develop these by going off National Forest System Trails, thus it is not a System Trail.

Planning Area: The Planning Area for this analysis is the Arapaho and Roosevelt National Forests (ARNF). This relates to the analysis of plants, fish and wildlife only. The National Forest Management Act (NFMA), 36 CFR 219.19 and Forest Service Handbook (FSM 2621) direct the Forest Service to preserve and enhance plant and animal diversity, consistent with the overall multiple use objectives, to maintain viability of all native and desirable non-native species on the Planning Area (i.e. National Forest or Grassland).

Project Area: The Project Area for this analysis is the approximately 6,000 acres on the Boulder Ranger District of the Roosevelt National Forest as depicted on Map 1, Appendix A.

Sensitive Species Determinations: (Forest Service Manual 2600, Region 2 Supplement # 2600-2015-1 and R2 and Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP) Biological Evaluation/Biological Assessment templates)

For Region 2 Sensitive Species Determinations Can Be:

- **No Impact.** No effect is expected.
- **Beneficial impact.** Effects are expected to be beneficial.
- **May adversely impact individuals, but not likely to result in a loss of viability on the Planning area, nor cause a trend toward federal listing.** Effects are expected to be insignificant (unmeasurable), or discountable (extremely unlikely).
- **Likely to result in a loss of viability on the Planning area, in a trend toward federal listing.** Effects are expected to be detrimental and substantial.

Snow Compaction: An area of consistent snow compaction is defined in the 2008 Supplemental Biological Assessment for the Southern Rockies Lynx Amendment as an area of land or water that during winter is generally covered with snow and gets enough human use that individual tracks are indistinguishable. In such places, compacted snow is evident most of the time, except immediately after (within 48 hours) snowfall.

Threatened and Endangered Species Findings: (from US Fish and Wildlife Service consultation handbook, https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf)

- **No effect/no adverse modification.** This conclusion is reached if the proposed action and its interrelated and interdependent actions will not directly or indirectly affect listed species or destroy/adversely modify designated critical habitat.
- **May Affect, but is not likely to adversely affect species/adversely modify critical habitat.** This conclusion is appropriate when effects to the species or critical habitat are expected to be beneficial, discountable, or insignificant. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact (and should never reach the scale where take occurs), while discountable effects are those that are extremely unlikely to occur.
- **May affect, and is likely to adversely affect species/adversely modify critical habitat.** This conclusion is reached if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed Service action or its interrelated or interdependent actions, and the effect is not discountable or insignificant (see definition of "is not likely to adversely affect").

Unmanaged Recreational Use: Recreation use that occurs on National Forest System (NFS) lands as a result of pressures for recreational opportunities that have little to no planning. Erosion, user conflicts, spread of invasive species, damage to cultural sites, disturbance to wildlife, destruction of wildlife habitat, and risks to public safety can result from unmanaged recreation use.

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 Introduction

This Environmental Assessment (EA) describes and discloses the direct, indirect and cumulative environmental effects of the no action alternative and the proposed action for developing a sustainable trail system in the Magnoila area of the Boulder Ranger District. The purpose of doing an EA under the National Environmental Policy Act (NEPA) is to determine whether or not an Environmental Impact Statement (EIS) is needed. If no significant effects are found and disclosed in this EA, then an EIS will not be prepared. A Finding of No Significant Effects (FONSI) is included at the end of this EA to disclose if this analysis has found any significant effects. This EA is not a decision. Accompanying this EA is a draft Decision Notice, disclosing the decision the Boulder District Ranger is likely to make.

Location

The Project Area totals approximately 6,000 acres on the Boulder Ranger District of the Roosevelt National Forest in Boulder and Gilpin Counties, Colorado (Map 1, Appendix A for the project location). The project occurs predominantly on National Forest System (NFS) lands, but there are interspersed private and Boulder County lands. The project area is on both sides of the intersection of Highway 72/119 (Peak-to-Peak Highway) and Magnolia Road. The western portion of the intersection is known locally as Haul Road. The eastern portion is also along Magnolia Road known as Highway 132. This project area is located between the town of Nederland to the north and the town of Rollinsville to the south. The project extends south to Gilpin County Road 16 and west to private lands. The area location is in both Boulder and Gilpin Counties: T. 1S, R. 73 W, sections 13, 23, 24, 26, 27, 34, 35, 36 and in T. 1S, R. 72 W, sections 9, 10, 15-21

The Magnolia area is predominately located in the Lump Gulch Geographic Area. There is a small portion of the Boulder Creek Geographic Area in the northwest portion of the project area and a small portion of the Thorodin Geographic Area in the southeast portion of the project area (Map 2, Appendix A).

Descriptions of these geographic areas can be found in Chapter 2 of the *1997 Arapaho and Roosevelt National Forests and Pawnee National Grassland Land and Resource Management Plan (Forest Plan)*. For purposes of delineation the project area has been divided into three zones: East Magnolia, West Magnolia, and South Magnolia (Map 3, Appendix A). East Magnolia is all lands east of the Peak-to-Peak Highway in Boulder County. West Magnolia is the lands west of the Peak-to-Peak Highway and north of the Gilpin County line. South Magnolia is the lands west of the Peak-to-Peak Highway but south of the Gilpin County line.

1.2 What is the Forest Service Proposing? _____

The Forest Service proposes to re-route some existing trails, create new trails, close system and social trails, and convert some portions of roads and social trails to system trails.

Additional proposed actions include:

- Equestrian and bicycle users would be restricted to designated trails.
- All new social trails created after the decision of this analysis would be obliterated.
- Snowmobiles would be prohibited within the project area for resource protection.
- Winter grooming for Nordic and fat tire use would be allowed under a Forest Service authorization on approximately 4 miles of existing roads (see the online map).

This proposed action includes an adaptive management component to allow for changes on the trail system as it is developed and used. These changes could be on the environmental landscape (e.g., climate, wind events, floods, wildlife movement); the functioning of the trails, both from its ecological sustainability or recreation management perspective; and the effects of winter recreation use on lynx habitat.

We anticipate that it may take 10 years to fully implement this sustainable trail system with the help of partners and volunteers. Funding for this project would be a mix of Forest Service, other agency funding as well as State and private grant monies.

1.3 Why is the Forest Service Proposing a Project in this Area? ___

The Magnolia area of the Boulder Ranger District contains a large network of non-motorized system and social trails. Over the past several decades, this trail system has experienced a substantial increase in recreation use, including unauthorized trail construction (also known as non-system or social trails). This use has led to resource damage, trail damage and unmanaged recreation use in the project area. As a result, the trail system has become unsustainable with environmental impacts increasing every year.

Trail system improvements are needed to comply with the intent of *Forest Plan* direction to provide outdoor recreation opportunities, and reduce visitor conflicts and resource impacts. An effective trail system provides a safer recreation experience for visitors, who are less likely to get lost. In addition, an effective trail and trailhead system minimizes the impacts associated with the creation of social trails and ad hoc parking areas, improves sanitation, reduces soil compaction and erosion, sedimentation of sensitive waterways, and minimizes impacts to cultural values and sensitive wildlife habitat.

Another reason this project is needed is due to the 2012/2013 fuels reduction project in the western portion of the project area. As a result of the fuels reduction project, the landscape

experienced a change and some trails needed to be either re-routed or repaired in response to this new condition. Another fuels project is planned for the eastern portion of the project area and the Forest Service is analyzing the effects of both of these projects. These past and future changes in landscape conditions have resulted in the need for this current planning effort, including an emphasis on adaptive management for future changing conditions.

Additionally, the Boulder Ranger District has partnered with Boulder County to provide sustainable connector trails from NFS lands onto County trail systems. The County's Reynolds's Ranch Open Space, located in the central and eastern portions of the project area (East Magnolia), and the Toll Conservation Easement for a trail crossing the southwestern portion of the project (South Magnolia) offer unique opportunities to tie in with the trail systems that the County is planning. An update to the 2013 proposed action was made during the planning process to accommodate the recent Toll Conservation Easement on 5000 acres of private land bordering the western edge of the project area that includes a trail easement that would provide regional connectivity with Forest Service system trail alignments being proposed within this project area.

1.4 What is the Purpose of this Project? _____

The purpose of this project is to create a sustainable and manageable non-motorized trail system within the Magnolia area. The desired condition is to have a well-functioning trail system that the recreating public uses and enjoys and that minimizes impacts to other resources in the area. The objectives for this project are:

- To enhance the recreation experience of the non-motorized recreating public by:
 - providing a trail system that is both sustainably built and agency compliant;
 - providing a safer recreation experience for users of the system, who are less likely to get lost by providing adequate signing along the trail system and information at trailheads;
 - providing a high-quality recreation user experience by offering a variety of trail experiences, both in difficulty and character, that would minimize the impacts associated with the creation of social trails;
 - minimizing conflict between the various non-motorized users by designing optimized trail features within the multi-use trail system;
 - providing community access points to the trail system near the towns of Nederland and Rollinsville;
 - providing a regional connection with the Toll Conservation Easement Trail to the west of the Magnolia project area and with Boulder County's Reynolds Ranch Open Space area in the eastern portion of the project area;

- improving sanitation with toilet facilities at trailheads;
- addressing increasing winter recreation use, by providing a groomed non-motorized trail system for on-snow/winter use.
- To reduce soil compaction and erosion by correctly locating, designing and constructing trails
- To minimize impacts to wildlife and their habitat
- To provide flexibility to adjust the trail system after implementation if monitoring of the system indicates that changes would be necessary to continue to meet the purpose of a sustainable trail system

1.5 What is the Forest Plan Direction? ---

Geographic Areas

The majority of the project area and associated proposed actions are located within the Lump Gulch Geographic Area of the *Forest Plan*, pages 81-83.

For the Magnolia Area, the goals of this geographic area for travel management (roads and trails) are to:

- Manage road and trail systems in the area to provide a variety of recreational opportunities while minimizing human-wildlife conflicts, particularly in flora and fauna emphasis areas (management area 3.5). This will be accomplished in the West Magnolia portions of the geographic area by closing roads to motorized vehicles, including snowmobiles, during the winter and spring.
- Manage the area for year-round recreational use. Most existing trails will be retained and the trail system may be considered for limited expansion
- Manage recreational uses and road and trail networks to reduce erosion or deterioration of riparian areas and watershed conditions. Evaluate road and trail impacts to aquatic and riparian ecosystems during travel management planning.

Management Areas

Management areas define where differing kinds of resource and use opportunities are available to the public and where different management practices may be carried out. They are closely analogous to zones and zoning ordinances in county or city land-use plans. Management areas may not be contiguous geographically. A very important function of delineating a management area is to define spatially where differing types of resource-use opportunities are available to the public in

each alternative.

There are four predominant management areas within the project boundary. The East Magnolia zone is mainly 7.1 Intermix and 3.5 Flora and Fauna. The West Magnolia zone is predominantly 4.3 Dispersed Recreation. The South Magnolia zone is predominantly 3.5 Flora and Fauna. Along the Peak-to-Peak Highway the management area is 4.2 Scenery. The following goals and objectives for the project are based on the *Forest Plan* (Chapter 3) guidance for these management areas:

Forested Flora and Fauna Habitats (3.5), *Forest Plan*, Chapter 3, pp 355-58: Management emphasis is on providing adequate amounts of quality forage, cover, escape terrain, solitude, breeding habitat, and protection for a wide variety of wildlife species and associated plant communities.

- Discourage or prohibit human activities and travel, where needed, to allow effective habitat use by wildlife species, especially during the seasons of birthing and rearing of young.
- Provide dispersed recreational opportunities outside critical periods for wildlife. Restrict recreational use to the extent necessary to protect the values for which the area is designated.
- Road and trail construction activities rarely occur and are primarily for obliteration or relocation of travelways that are causing resource damage.

Scenery (4.2), *Forest Plan*, Chapter 3, pp 362-63: Areas are managed to protect or preserve scenic values and recreational uses of designated scenic byways and other heavily used scenic travel corridors.

- Provide a variety of motorized and non-motorized recreational opportunities. Open roads provide access and roaded recreational opportunities, while closed roads provide non-motorized opportunities.
- Facilities may be present to enhance viewing or recreational opportunities. Improvements such as improved roads, primitive roads, trails, bridges, fences, shelters, overlooks, signs or water diversions will blend into the landscape where feasible, be removed if no longer needed, or will be designed to be minimally intrusive into the landscape. Private facilities and communities may be present along these corridors.
- Directional, regulatory and informational signs are frequent to foster safe use, identify requirements for use of the area, and to provide route information.

Dispersed Recreation (4.3), *Forest Plan*, Chapter 3, pp 364-65: Dispersed recreation areas are managed to provide recreational opportunities in natural or nearly natural-appearing landscapes.

- Provide simple information facilities. Directional, regulatory and informational signs are present and foster safe use, identify requirements for use of the area, and provide route information.
- Developed facilities, including campgrounds, picnic areas, and trailheads, may be provided to meet recreational demands within the area's resource capacity.
- Open roads provide motorized recreational opportunities and restricted roads provide non-motorized opportunities.

Residential/Forest Intermix (7.1), *Forest Plan*, Chapter 3, pp 378-79: Areas characterized by an interface between residential private lands and NFS lands are managed to protect natural resources, provide compatible multiple uses, and maintain cooperative relationships between the landowners

and other levels of governmental jurisdiction. Opportunities to consolidate landownership patterns are pursued.

- Blend existing improvements such as improved roads, primitive roads, trails, bridges, fences, shelters, signs, recreational sites, or water diversions into the landscape where feasible or remove them if no longer needed.
- Retain or acquire lands containing important recreational values or important access routes to NFS lands. Pursue rights-of-way needed for management purposes.
- Coordinate trail systems with other local agencies. Attempt to link trails to other management areas, developed sites and other nearby trails. Locate new facilities (trailheads, parking areas, designated sites, developed sites, etc.) in areas to help minimize conflicts.

Travel Management

The *Forest Plan* winter travel management strategy map for the entire project area states, “motorized use not emphasized, non-motorized not emphasized”. The *Forest Plan* summer travel management strategy for the majority of the project area recommends “4wd system exists with potential for a decrease” and a small amount of land adjacent to the Scenic Byway as “No 4wd opportunities exist, no increase expected”. Also, 100% of the project area states “No motorized trail opportunities exist, no increase expected.”

The travel management strategy for each management area is depicted for the Lump Gulch Geographic Area. Additionally, the following strategies exist for the Lump Gulch Geo Area (*Forest Plan*, pp 80-83):

- Manage the area for year-round recreational use.
- Manage the rest of the road and trail systems in the area to provide a variety of recreational opportunities while minimizing human-wildlife conflicts, particularly in flora and fauna emphasis areas (MA 3.5). This will be accomplished in the West Magnolia portions of the geographic area by closing roads to motorized vehicles, including snowmobiles, during the winter and spring.
- Motorized travel will be featured on some existing 4WD routes. Most existing trails will be retained and the trail system may be considered for limited expansion.
- Manage recreational uses and road and trail networks to reduce erosion or deterioration of riparian areas and watershed conditions.

Effective Habitat

The *Forest Plan* defines effective habitat as mostly undisturbed habitat, which is buffered from regularly used roads and trails, including both motorized and non-motorized travel (USFS 1997). Buffer distances vary based on vegetation cover and topography. All system roads and trails on the Arapaho and Roosevelt National Forests and the Pawnee National Grassland (ARP) are considered to be regularly used for purposes of effective habitat mapping. In the wildlife section of the *Forest Plan* (pp.30-31) there is direction for effective habitat. Refer to the Glossary (p. iv) for definitions of *Forest Plan* Standards (ST), Guidelines (GL), and Goals (GO).

- **Goal 95.** *Retain the integrity of effective habitat areas.*
- **Guideline 106.** *Exclude human activity in key elk-calving areas during a minimum period of May 15 to June 15 and in key winter range of elk and deer for a minimum of December 1 through March 30 with the exception of through routes*
- **Guideline 107.** *Avoid disconnecting or severing intact areas of effective habitat with new open roads and trails. Favor seasonal use during non-critical times for wildlife when this cannot be avoided.*
- **Guideline 108.** *When developing new open roads and trails, do not reduce contiguous areas of effective habitat to less than 250 acres or further reduce effective habitat of 20 to 250 acres in size, except where access is required by law.*
- **Guideline 109.** *Additional open roads and trails should not reduce effective habitat below 50% by Geographic Area, or further reduce effective habitat in Geographic Areas that are already at or below 50% on NFS lands.*

Additional habitat effectiveness guidance can be found in Chapter 3 of the *Forest Plan*, Management Area 3.5, Forested Flora and Fauna Habitats (p. 359).

- **Standard 2.** *Maintain or increase habitat effectiveness, except where new access is required by law.*
- **Standard 3.** *Discourage or prohibit human activities and travel, where needed, to allow effective habitat use during season of primary use by elk, deer and bighorn sheep (at least the minimum periods of May 15 through June 30 for elk calving, June 1 through June 30 for deer fawning, May 15 through June 30 for bighorn lambing, and December 1 through March 31 for wintering deer, elk and bighorn).*
- **Standard 4.** *Discourage or prohibit human activities and travel, where needed, to allow effective habitat use by other wildlife species, especially during the seasons of birthing and rearing of young.*

Interior Forest

Interior forests are considered to be contiguous areas of relatively dense and large trees that are buffered from the temperature, light, and humidity differences of sizeable openings in the forest, and from human disturbance along regularly used roads and trails (USFS 1997). Interior forest areas occur entirely within effective habitat, which was defined in the preceding section. Other than Guideline 92 regarding selection of Management Indicator Communities (MIC), there are no *Forest Plan* standards or guidelines specific to interior forest. Because interior forest is entirely within effective habitat, *Forest Plan* effective habitat guidance addresses interior forest to a certain degree.

Forested and Open Corridors

Forested corridors in the project area are important for a variety of wildlife species, especially larger mammals including elk, mule deer, moose, mountain lions, and black bears. Defined in the *Forest Plan* (USFS 1997) by a combination of forest structural stages, minimum area of 20 acres, minimum

width of 100 meters, and maximum width of gaps or interruptions of 100 meters, mapped forested corridors are abundant Forest-wide.

1.6 What is the Decision and Who Makes the Decision? _____

Given the purpose and need, the deciding official (the Boulder District Ranger) reviews the Proposed Action and the No Action Alternatives in order to make the following determinations:

- The proposed recreation management/development project complies with applicable standards and guidelines found in the *Forest Plan* and all laws governing Forest Service actions.
- Sufficient site-specific environmental analysis has been completed.
- The proposed project benefits most of the public and is in their best interest.

With these assurances the Boulder District Ranger must decide:

- Whether or not to accept the Proposed Action, modify the proposed action within the bounds of the effects analysis or do nothing (the No Action Alternative).
- What, if any, additional actions should be required to better manage natural resources and recreational opportunities in the project area.

The decision will apply to only NFS lands.

1.7 How has the Public Been Involved? _____

Following recent fuel treatments which changed some of the trail opportunity in the western zone of the project area, the strategy for the management of the trail system within the project area has included agency planning efforts supported by agency partnerships. One such effort culminated in the Proposed West Magnolia Trail System Master Plan (ContourLogic 2014). This report has been considered along with numerous other forms of public comment to reach the proposed action presented in this Environmental Assessment.

The Forest Service initiated public scoping and requested comments on its proposed action in August 2013. An information meeting at the Nederland Community Center was held in August during the comment period. More than 300 comment letters were received, with nearly as many unique comments. Many commenters were interested in having the Forest Service enable trail connectivity to Rollins Pass. In response to requests for connectivity, and with the agreement between the Toll family (private landowners) and Boulder County to establish the Toll Conservation Easement Trail to the south and west of the project area, the Forest Service revised its proposed action by expanding the project area south and west, adding an estimated 1,700 acres. Additionally, this revised proposed action addresses many of the other comments such as: intermixed private lands and private landowner concerns; Nordic and equestrian opportunities; and trail sustainability. Because of these additions, and the length of time since the first scoping, the Forest Service wanted to provide the public another comment period.

More than 300 e-mails and postal mail were sent to interested publics. Publishing the legal notice in the Boulder Daily Camera on September 14, 2015 initiated the 30-day comment period. Over 400 letters and e-mails were received. Approximately 800 unique comments were identified, though many of these could be grouped into very similar comments. See Appendix C for the Forest Service response to these comments.

Public comments received on the proposed action sent to the public in 2015 caused a modification to the proposed action by putting Social Trail 4 back into the proposed action. This trail provides a connection to the community of Nederland from the East Magnolia zone. It was pointed out that Social Trail 38 was labelled on three different sections. This was corrected and these sections are now labelled Social Trail 38, 42 or 43. During final analysis it was discovered that Social 36 was labelled on two different sections. This was corrected and these sections are now labelled Social Trail 36 and 41. See Appendix B for a list of all trails included in the proposed Action

In addition to Forest Service outreach, a Colorado State Trails Planning Grant funded a planning effort that included a public open house and a survey of recreational users of the Magnolia Area. More than 20 stakeholder groups and agencies and nearly 700 individuals were contacted. From these efforts a Proposed West Magnolia Trail System Master Plan was developed. (ContourLogic, 2014)

Using all these sources of comments, the Forest Service developed the issues it would address in detail for this analysis. Some public issues were incorporated into the proposed action and some public issues were determined not to require detailed analysis. The next section discusses these issues in more detail.

1.8 What Are the Issues to be Analyzed? _____

Both the public comments received on the proposed action during the scoping and 30-day comment periods and issues raised internally by the Interdisciplinary Team were carefully reviewed in this analysis. Chapter 3 addresses the issues. The identified issues are broken into three groups:

1. **Issues to Be Analyzed.** Issues are used to develop and analyze the alternatives. They involve potential effects to resources that might not be addressed by existing laws, *Forest Plan* standards and guidelines, policies, or design criteria.
2. **Other Legally Required Issues to Be Analyzed.** Issues that address the Endangered Species Act need more in-depth analysis and disclosure to ensure that the effects can be kept below the NEPA definition of “Significance”. See the Finding of No Significant Impacts near the end of this document. (See Chapter 3 of this document for discussion of effects to these “Other Issues” by alternative.)
3. **Issues Which Have Been Incorporated into the Revised Proposed Action.** To be responsive to many of the comments the public provided, the Forest Service made iterative changes to the proposed action.

4. **Issues Dismissed from Detailed Analysis.** These issues are not given detailed analysis because the potential effects do not vary between alternatives and/or the effects can be addressed and kept below the level of significance by design criteria. These issues are not analyzed in detail if they are addressed by existing laws, Standards and Guidelines or Forest Service regulations and policies, or are not within the scope of the proposed action.

The following are the issues raised during public involvement and internal scoping efforts applicable to this proposed project. These issues have been separated into the groups as described above:

Issues to Be Analyzed:

1. Recreational Use Of The Project Area:

- a. Non-motorized recreation use could:
 - i. Cause conflicts among users (private landowners, equestrians, hikers, mountain bikers, campers, hunters, and motorized users).
 - ii. Provide opportunities for select recreational users and not others.
 - iii. Cause the trails to deteriorate by overuse or inappropriate use.
- b. Motorized wheeled recreation use of roads could:
 - i. Be affected by elimination or conversion to trails, segments of motorized roads.
- c. Motorized snowmobile recreation use could:
 - i. Be affected by elimination of snowmobiling in the project area.
- d. The proposal to improve the current non-motorized trail system would not improve the Forest Service's ability to manage the trails and enforce regulations in the area. A lack of funding and personnel exacerbate this issue.

2. Physical Sustainability Of The Non-motorized Trail System

- a. The non-motorized trail system could adversely affect soils, hydrology, and the spread of noxious weeds because the trails may not be designed or maintained in a sustainable fashion.

3. Wildlife In The Project Area

- a. Non-motorized and motorized users within the project area during all seasons could disturb wildlife and fragment wildlife habitat. In particular, trails and associated activities may impact effective habitat, as defined in the Forest Plan as well as spring and fall elk migration.

Other Legally Required Issues to Be Analyzed:

1. The Endangered Species Act of 1973 requires analysis of the effects to Proposed, Threatened or Endangered wildlife, fish and plant species that could be affected by the project proposal. Lynx, a threatened species, may be adversely impacted by snow compaction caused by use in the winter months.
2. Forest Service regulations require analysis of Regionally Sensitive wildlife, fish and plant species as well as Management Indicator Species (MIS) that could be affected by the project proposal.

Issues Which Have Been Incorporated into the Revised Proposed Action:

The Forest Service has been responsive to many issues that were brought up during the public comment period by incorporating these into the proposed action as long as the project's purpose and need could still be met.

- **Trespass on Private Land:** Trails were adjusted or eliminated where private landowners did not want the trail crossing their lands. Any future trails crossing private land would require landowner approval. It is noted that some trails still cross private lands.
- **Accommodate a Variety of Non-motorized Uses (not just bike-centric):** This has always been the intention of the Forest Service. The trail system would be opened to all non-motorized uses.
- **Connect The Magnolia Trail System to Areas Outside of the Project Boundary, Specifically to the West towards Winter Park:** The project area has been expanded to the southwest from the Forest Service initial proposed action project area. This expansion allows the Forest Service proposed trail system to connect with the Toll Trail Conservation Easement acquired by Boulder County. The Toll Trail provides this western connection. Other suggested trail connections would be included with future planning with Boulder County or are not possible at this time due to private landowners concerns.
- **Trailhead Development:** The proposed action now includes toilet facilities, horse trailer accommodations (only at the West Magnolia Trailhead) and some expansion of the number of parking spaces.
- **Accommodate Winter Sports:** Certain roads within the West Magnolia area have been identified to allow multi-use groomed non-motorized winter use, such as snowshoeing, Nordic skiing (diagonal and skate) and fat tire bicycles if the Forest Service approves an application for winter grooming under a special use authorization. Snowmobiling has not been a popular activity in the project area. Because non-motorized uses have been the dominant use, the Forest Service has formally stated in the proposed action that snowmobiling would not be allowed in the project area.

- Quiet Uses are Not Available: This issue describes “quiet uses” as non-motorized uses such as hiking, horseback riding, birdwatching... This Magnolia Trails Project is improving an existing non-motorized trail system, which provides quiet use recreation.

Issues Considered but Not Analyzed Further:

Per NEPA regulations issues raised during public input can be dismissed from further analysis if the issues are: not within the scope of the analysis; decided by law, regulation, or previous decision; not related to the decision; not amenable to scientific analysis rather than conjecture; and limited in extent, duration, or intensity.

- Historic Hockaday Cabin on Reynolds Ranch: This is on Boulder County lands and not within the Forest Service jurisdiction. All historic or potentially historic sites within the project would be evaluated. No action is proposed for the Reynolds Ranch, therefore this is outside the scope of this analysis.
- National Historic Preservation Act (NHPA) Section 106 consultation would be negotiated with the appropriate agencies (the Colorado State Historic Preservation Office (SHPO); the Tribal Historic Preservation Officer(s) (THPO); the Advisory Council on Historic Preservation (ACHP); and/or other interested consulting parties) prior to implementation (in accordance with 40 C.F.R. 1500-1508). Design criteria (see Chapter 2, Alternative B-Proposed Action) have been established so as to avoid adverse direct or indirect effects to the known historic property (a segment of the Rollinsville and Middle Park Wagon Road) within the project area. Because design criteria include review of all trails during the design and layout phase prior to any ground disturbance, no further disclosure of effects would be included in this document. The reader is directed to the project record for the full cultural resource report.
- Increased Traffic on the Major Roadways such as the Peak-to-Peak or Magnolia Roads: Many activities on and uses of the lands surrounding the Magnolia Area can cause increased traffic including the attraction of a designated scenic byway and private communities with commuters travelling on the roadways. It is not scientifically possible to separate which vehicles on the roadways could be attributed to improving an existing non-motorized trail system.
- Development of a Trailhead in the Town of Nederland to Support the Local Economy: This is an excellent idea, but outside the scope of this analysis. There are possible connections to the Forest Service proposed trail system and local communities are encouraged to make those connections and trailheads on their lands.
- Develop bicycle-specific downhill, one-way, and purpose-built trail features such as logs, rocks, jumps...: The purpose and need for this project is to create a sustainable non-motorized trail system from the existing non-motorized trail system. The existing system has numerous user-created trails, trails in need of relocation (located in clearcut areas or showing considerable erosion) and could serve the public better with additional trails for trail connections. For this proposed action, the Forest Service is concentrating on

development of a multi-use trail system for non-motorized uses; however, adaptive management has been included to be able to review trails as they are being used to determine a place to meet these mountain bike trail features in the future if they can be built in a sustainable way. But for the purposes of this analysis, bicycle-specific trail features and downhill trails are not included.

- Consistent Regulations between the Forest Service and Boulder County Lands: We would strive to work towards consistency, but this is outside the scope of this project.
- Provide Motorized Single-Track Trails for Motorcycles: The trail system as it currently exists does not allow motorized uses. The *Forest Plan* Summer Travel Strategy Map for the entire project area states that “No Motorized Trail; Opportunities Exist; No Increase Expected” (USFS 1997). Motorized use is allowed only on the roads in the area. No motorized trails are identified in the Boulder Ranger District Motor Vehicle Use Map within the project area. Providing for motorized trail uses does not meet the purpose and need and it is outside the scope of this project.
- Allow Dogs Off-Leash: Currently in general forested areas dogs need to be under voice and sight control.
- Transient Use, Shooting and Fires: These issues are also concerns of the Forest Service and other local governments, but these issues are being addressed through other means. These issues are outside the scope of this project.
- Climate Change: Differences between alternatives (no action and proposed action) would be immeasurable or negligible for this project. Carbon sequestration would be unaffected because the amount of trees and other vegetation to be removed is small and offset by growth of new trees (after beetle infestation and fuels treatments) in the project area. The scale of climate change is many orders of magnitude larger than this project and for this project cannot be scientifically measured.

CHAPTER 2 – ALTERNATIVES

2.1 Introduction

This chapter describes and compares a range of reasonable alternatives considered for the Magnolia Trails Project. Applicable specific project design criteria and monitoring are described in this chapter for the alternatives as well. No other alternatives were considered or eliminated for analysis for this project. “In the iNEPA (iterativeNEPA) context, agencies can iteratively, and in collaboration with other stakeholders, focus on one particular alternative that meets as many interests as possible, but they must continue to analyze a range of reasonable alternatives if available. (University of Wyoming, *Iterative NEPA and Collaboration: Proceedings of the iNEPA Workshop February 10 and 11, 2014, Salt Lake City, Utah*, p.13). The initial proposed action that was scoped in 2013 was revised after analyzing the public comments. The public had the opportunity to comment on this revised proposed action in 2015. Comments from the 2015 comment period led to a few tweaks of the revised proposed action. This iterative process is allowed within Forest Service regulations (36 Code of Federal Regulation 220.7(b)(2)(iii) and NFS Handbook 1909.15, 42.22). Alternative B is the iterative proposed action now simply called “Proposed Action”. Per public comments and this iterative process the No Action and the Proposed Action fulfill consideration of a reasonable range of alternatives.

2.2 Alternatives

Two alternatives were studied in detail. These include:

Alternative A: No Action Alternative

Alternative B: Proposed Action Alternative: Improved Non-motorized Trail System

Alternative A – No Action

Under Alternative A, the No Action Alternative, the management of the trails in the Magnolia area of the District would remain the same as they are currently managed (see Map 5, Appendix A). No changes to the trail system would take place and trail improvement and realignments would not take place as well. Additionally, no trail closures or trail additions would take place under the No Action Alternative, nor would social trails be obliterated.

There are no design criteria, adaptive management or additional monitoring activities for Alternative A because there are no new actions under this alternative. With no new actions, all management activities of the area would remain the same as current activities. Monitoring activities would remain the same as what is currently done.

Alternative B – Proposed Action: Improved Non-motorized Trail System

Throughout the planning process public input had been gathered during many opportunities. Considerable effort was made to include public input above and beyond NEPA requirements to ensure a thorough analysis. One of these efforts included a 30-question survey from February 26 and March 13, 2013 that was sent to more than 20 stakeholder groups (including neighboring agencies) and nearly 700 individuals who had expressed interest in the project during pre-scoping efforts. The survey was designed to understand how the public recreates currently within the project area and how the public would like to see the trail system and recreation opportunities developed in the future. The complete survey is not included in this report but was considered in the overall development of the proposed action and can be found on pages 7-19 of the *Proposed West Magnolia Trail System Master Plan* (ContourLogic 2014).

One concern expressed was that mountain residents and front-range residents had different goals and vision for the project area, however, survey results and overall collected feedback showed no measurable difference in opinions. A higher percentage of Nederland residents responded to the survey than Boulder residents based on total town populations.

Public input reflects that mountain biking is the primary recreation use on the existing trails within the project area. This is consistent with prior agency recreation planning analysis (*Caribou-West Magnolia EA/Decision of 2003* and *Forest Plan*) for the project area. The intent of the proposed action is to maintain multi-use access across all trails, while some trails within the project area may be optimized for specific user groups.

Public input indicated a majority desire for a variety of trail character and challenge, with intermediate and advanced trails being the most desirable. Survey respondents indicated a desire for “optimized” trails related to mountain biking (87%) and equestrian use (16%). Optimized trails relate to design specific parameters that can better meet the needs of a specific user group without necessarily prohibiting other user types. Examples include, experience/challenge-based trail design, optional technical features, and directional trails.

Responses to survey questions related to existing user conflict within the project area showed that 77% of respondents felt no or very little conflict on the trails. Of the conflict concerns that were expressed, most were related to illegal motorized use, loose dogs, and poor trail etiquette. The proposed action aims to decrease these types of user conflicts through continued education and enforcement and improved trail system navigability and signage.

The proposed action considered public input from numerous public meetings, a public survey, and multiple public comment periods as the proposed action was updated during the planning process. The proposed action complements identified neighboring community goals and bordering agency/private land management goals and concerns. This is evident from the proposed action being updated as a result of initial public input and better opportunities with bordering land agencies. The proposed action follows Forest Service policy direction and aims to address unmanaged recreation within the project area.

The proposed action would improve an existing non-motorized trail system by making it a more sustainable and manageable, non-motorized, trail system. The proposed project is in the Magnolia area of the Boulder Ranger District (see Maps 6 and 7, Appendix A). This is an area of approximately 6000 acres with multiple ownerships (Forest Service, County and Private) both east and west of the Peak-to-Peak Highway (Colorado State Highway 72/119). The proposed action includes re-routing existing system trails, creating new trails, closing system and social trails and converting some roads and social trails to official classified trails. An increase in system trail miles is expected from this proposed action, however when converting social trails to system trails and decommissioning the rest of the social trails, there is a one-third decrease in the amount of total trails in the project area. One-way, directional, gravity trails or purpose built trail features are not included for this proposed action, but they may be considered in the future as long as these trails or features can be built to meet the trail sustainability objective.

Trail grooming for winter use would occur when adequate snow allows non-motorized uses. Winter non-motorized uses outside of the groomed trail system would still be allowed to occur if snow compaction does not affect lynx habitat (see adaptive management component relating to lynx). Winter motorized uses including snowmobiles would not be allowed in the area. Winter grooming for Nordic and fat tire bicycle use would be allowed under Forest Service authorization in the West Magnolia area only on Roads 132.W; 355.1; 355.1A; 355.1C; and 355.1D. Infrastructure such as a shed to store the grooming equipment is not proposed on NFS lands. The Forest Service would work with the Colorado Department of Transportation (CDOT) to determine a suitable turnaround on NFS Road (NFSR) 132.W (Haul Road) for the winter season.

A summary of the trail mileage for this proposal is found in Tables 1, 2 and 3 in this chapter. Aside from Maps 6 and 7 in Appendix A, two maps of the revised proposed action can be found on the Forest Service website at: www.fs.usda.gov/goto/arp/MagnoliaTrails. One map shows what action would be taken on each individual road and trail. The other map shows what the final system would be if fully implemented. For a detailed trail-by-trail, road-by-road description of the proposed action, please refer to the tables in Appendix B and the website. The tables list proposed actions for each individual trail or social trail or road. Note that on the trail table in Appendix B, "No Action" for any system trail indicates it will remain a system trail, however, it may need realignment or other improvement work to make it a sustainable trail under Forest Service trail standards. To prevent further recreation use and resource damage, social trails not identified on the map and table would be excluded from the trail system and obliterated. All new social trails created after a decision is made on this analysis would be obliterated.

Expected full implementation of the trail system by the Forest Service and its partners may take up to 10 years with approximately 10% to 20% accomplished each year (the percentage may be accelerated the first 5 years). As trails in an area (subset of the project area) are finalized, the social trails would be obliterated in that same area. It is expected that as a section of trail is finalized that the same mileage of social trails would be obliterated in a 1:1 ratio or with a greater ratio of social trails obliterated to trail section finalized. Obliteration may include rehabilitating (i.e., rippling and seeding the trail tread) the full trail or rehabilitating the entry points of trails so that they are no longer recognizable as trails. Once a final decision is made on this project, an implementation plan will be developed. Below is more specific information about the Proposed Action.

TRAILS

Trail Class:

- Level 2 through Level 4 (based on the US Forest Service Trail Level 1-5 scale with 1 being the least developed and 5 the most developed.)

Corridor Width Needed For Trail Design And Layout:

- 400' wide (200' each side of centerline). This relates to the area analyzed by Forest Service specialists, not the total impacted area of the final trail design nor the final trail width.

Final Widths:

- The trail system would be designed for optimized use, taking into account the type of non-motorized users for the trail. For instance some trails that would be suited for horses would require a wider width. Therefore, trail width would range between 1 and 4 feet. (On average, the trails are expected to be between 1' and 2'. The widest width of 4' would be collector points adjoining trailheads. Some places due to resource issues or safety concerns may require a wider trail width (e.g., trail structures, turning widths, or grade.)

Other Trail Features:

- Ancillary recreation activities, facilities, clearings (trail pullouts, passing lanes, overlooks, picnic clearing, hardened stream fords for horses, hitching posts, etc.) would be considered on a trail-by-trail basis.

Trail/Area Regulations:

- Winter motorized use (including snowmobiles) would be prohibited within the project area for resource protection (except by Forest Service authorization and special use permit). This would go into effect when the decision is finalized.
- Area seasonal closures throughout the road and trail system would be enforced when soils are excessively wet (usually in the spring after snow melts or if there are excessive rain events during the later summer monsoon season). These closures would go into effect as needed, though usually from November into May.
- Mountain bike and equestrian use would be restricted to designated roads and trails year round. Cross-country travel by mountain bike or horse would not be allowed. (Incidental off-trail use from an adjacent developed trail for picnicking and other incidental uses would be allowed.) This regulation would go into effect as implementation occurs throughout the project area.

Signing:

- Sign to minimize confusion of trail users, to provide a safe experience for trail users and to avoid social trail development. Use standard designs and procedures found in Engineering Manual 7100-15, Sign and Poster Guidelines for the Forest Service.

- Signs are a necessary component of trail management. They provide the user with information that would allow them to make an informed choice.
- The hierarchy of signs would be comprised of three levels:
 - Trail Network Kiosks – Located at a parking lot or similar entrance to a network of trails or trailhead. Basic information would be trail etiquette and safety.
 - Trail Junction Signs – Located at the entrance(s) of a particular trail to provide the user with the information necessary to make an informed decision whether to proceed or not.
 - Trail Advisory Signs – Used to alert users to: road crossings, acceptable or restricted users, and specific restrictions on the upcoming section of trail as these restrictions might arise.

Pursue Legal Public Access for Trails As Needed

- Some Forest Service trails cross other ownerships. The Forest Service would pursue acquiring or maintaining this access, whether it is on private or other agency lands.

Partnerships and Funding

- The Forest Service would pursue partnerships as well as alternative sources for funding for design, layout, implementation, operations and maintenance, obliterating user created social trails and public education.

Trail Design Guidelines:

- The trail system would be a combination of Trail Class: Level 2, 3 and 4 trails. See Forest Service Handbook (FSH) 2309.18, Chapter 20 for the Forest Service design parameters for non-motorized uses (Hiker/Pedestrian; Pack and Saddle; and Bicycle).
- Official direction for the USDA Forest Service can be found in:
 - Trails Manual (FSM 2353)
 - Trails Management Handbook (FSH 2309.18)
 - Direction found on the Forest Service website at:
 - [USDA Forest Service Standard Trail Plans and Specifications webpage \(http://www.fs.fed.us/recreation/programs/trail-management/trailplans/index.shtml\)](http://www.fs.fed.us/recreation/programs/trail-management/trailplans/index.shtml)
 - [Trail Construction and Maintenance Notebook \(0723-2806-MTDC, 2007\) \(http://www.fs.fed.us/t-d/pubs/htmlpubs/htm07232806/page02.htm\)](http://www.fs.fed.us/t-d/pubs/htmlpubs/htm07232806/page02.htm)
 - Forest Service Standard Specifications for Construction and Maintenance of Trails (EM-7720-103)
 - Sign and Poster Guidelines for the Forest Service (EM-7100-15).
 - Bridges and Structures (FSM 7722 and FSM 7736)
 - Forest Service Health and Safety Code Handbook (FSH 6709.11)
 - Deschutes National Forest: Mountain Bike Trail Standard: Tiered to FSH 2309.18 23.13 Bicycle Design Parameters

- Because design criteria found in the above Forest Service direction for biking trails is limited, additional bicycle standards would also be considered. These may include publications by: by the International Mountain Bicycling Association (IMBA), the Student Conservation Association (SCA), and the Appalachian Mountain Club. Publications include: *Managing Mountain Biking–IMBA’s Guide to Providing Great Riding*, 2007; *Trail Solutions-IMBA’s Guide to Building Sweet Singletrack*; *Lightly on the Land: The SCA Trail Building And Maintenance Manual 2nd Edition*; and *Complete Guide to Trail Building and Maintenance (Appalachian Mountain Club)*. Central Oregon Trail Alliance (IMBA affiliated non-profit organization) *Draft Trail Standard (October, 2011)*

Adaptive Management for System Trails

Forest Service recreation crews and Forest Service partners, either during routine maintenance or recreational use of the trails, would inspect the condition of the trail system for safety and resource concerns. Inspections would be recorded on Forest Service provided inspection sheets. The triggers for not passing inspection would be: 1) not meeting Forest Service trail standards and trail management objectives; 2) changes in the environmental landscape, 3) social use and user interaction on trails or 4) lynx habitat impacts due to snow compaction by winter forest users. If one or more of these triggers are identified the trail may be temporarily closed until repaired, have seasonal closures for wildlife requirements implemented, be realigned or permanently removed from the trail system through obliteration and revegetation or have user-specific modifications made. For any trail system adjustments Forest Service resources specialists would be consulted for design, layout and implementation. The following are examples for the four types of triggers.

Maintenance/Realignment/Closure/Obliteration Triggers

- 1. FSH 2309.18 Trails Management Handbook, Other Forest Service Direction or other Design Guidelines Used in this Project’s Trail Development and Approved Trail Management Objectives:**
 - Unplanned or excessive use of system trails
 - Short-cutting of climbing turns and/or switchbacks
 - Trail drifting or sliding down the hill
 - Unsafe conditions developing
 - Trail proliferation (widening or braiding)
 - Trail rutting or soil loss (erosions exceeding 6” depth)
 - Continued use of closed social trails/cross county travel
- 2. Changes in the Environmental Landscape**
 - Floods, wind events, fire, insect infestation
 - Changes associated with long-term management implications (fuels treatment or other projects causing displacement of trail users)
 - Changes in wildlife patterns such as elk movements, species populations, listing of Threatened or Endangered species

3. Social Use and User Interaction of Designated Trail System

- Users reaction to trail design (excessive or lack of use)
- User conflict (could lead to one-way trails or single user type only trail designation)
- Winter non-motorized users consistently expand beyond the groomed winter trail system nearing or into lynx habitat

4. Lynx Habitat Impacts Due to Snow Compaction by Winter Forest Users into Lynx Analysis Unit (LAU) (see Map 8, Appendix A)

Adaptive Management Actions

Trail Deactivation of an Existing System Trail (resulting in trail removal/obliteration) - There may be a number of reasons for obliterating an existing trail. When considering obliteration of a trail, take into account;

- Is the trail popular?
- Is the level of impact acceptable or can it be made acceptable by management?
- Can the trail or part of the trail be rerouted to improve the situation?
- Are there suitable alternatives for users if the trail is obliterated?
- Is the trail historically significant?

Alternates to Trail Obliteration

- Management of trail use
- Temporary closures
- Reroute sections of trail
- Exclusion of damaging users
- Education of users with signs or other education initiatives

When Considering Obliteration of System Trails

Steps could include the following:

- Public notice
- Signs informing users of reasons for closure
- Fencing
- Monitoring to ensure trail remains obliterated

Adjustments due to Lynx Habitat Impacts during the Winter Season

- If monitoring shows that consistent snow compaction develops in lynx habitat, implement winter closures as needed to prevent compaction. (see Glossary, p. iv for definition of snow compaction)
- If new winter non-motorized trails are proposed in the future, consult with a Forest Service wildlife biologist to insure that no winter trail expansion goes into lynx habitat.

Monitoring of Trail System

- Forest Service recreation crews and Forest Service partners either during routine maintenance or recreational use of the trails would inspect the condition of the trail system for safety and resource concerns. Inspections would be recorded on Forest Service provided inspection sheets and turned into the Forest Service for any necessary action.
- Forest Service Specialists/Program Managers: Monitor during and after implementation for design criteria implementation and effectiveness and to determine if triggers indicate adaptive management actions need to be taken.
- Monitoring Trip for Forest Service Specialists/Program Managers: Annually for the first several years and then as needed to assess the sustainability of the portion of the decision that has been implemented prior to the field review.
- Monitoring elk movement by Forest Service wildlife biologist in conjunction with monitoring by Colorado Parks and Wildlife and others to determine if adaptive management is needed to protect the elk migration corridor and/or winter range.

ROADS AND TRAILHEADS

No new roads are planned. Some system road sections may be converted to trails, designated for administrative use, or decommissioned and obliterated.

Signing:

- Sign to minimize confusion of road users and to warn motorized users of non-motorized trail junctions. Use standard designs and procedures found in Engineering Manual 7100-15, Sign and Poster Guidelines for the Forest Service.

Front Range and West Magnolia Trailheads:

- Toilet Facilities may be provided at the Front Range Trailhead and the West Magnolia Trailhead
- Horse trailer parking facilities may be provided at the West Magnolia Trailhead
- Parking capacity at each trailhead would be designed for approximately 10-25 vehicles

IMPLEMENTATION STRATEGY AND SCHEDULE

Forest Service funding for this project would be sought on an annual basis in alignment with Forest priorities and to support opportunities to leverage additional funding through outside sources, including but not limited to partnership and volunteer group fundraising and grant application opportunities. Managing and enforcing proposed regulations and maintaining the recreational opportunities within the project area would be achieved through Forest Service and related partnership involvement.

Implementation of the project would largely depend on partnership/volunteer group involvement. Involvement includes continued efforts towards on-the-ground project work, education, training,

fundraising, and grant applications to supplement Forest Service budgets and resources. Involvement in the implementation strategy would include an initial public meeting followed by partnership meetings as necessary. The implementation strategy would consider fundraising/grant cycle opportunities and subsequent on-the-ground project work would be phased in each year as resources become available. All implementation activities would be guided by the Forest Service.

Implementation strategy goals would include:

- Signing of the approved system as soon as possible after the decision and as implementation moves ahead.
- A zone-phased approach to implementing the decision’s actions, starting at the West Magnolia Trailhead and working outward.
- A zone-phased approach to best strategize funding opportunities and regional connectivity opportunities with adjacent agency/townships.
- Waiting to implement any portion of the decision until after any other current projects are analyzed and implemented (i.e. East Magnolia Zone and Forsythe 2 fuels treatment) that may directly affect the trail actions.

Table 1: Summary of Trail Mileages for the No Action and Proposed Action Alternatives (Mileages are only on NFS lands)

Trails	Alternative A: No Action (existing condition)	Alternative B: Proposed Action	
System Trails - Existing	16.03		
Social Trails	45.70*		
Total Miles of Existing System and Social Trails	61.73		
System Trails - Existing (no action)		14.28	14.28
New Trail Construction		8.94	8.94
Social Trails - Converted to System Trail		16.75	16.75
Road Converted to System Trail		4.11	4.11
System Trails - Decommissioned/Obliterated		(1.75)	
Social Trails - Obliterated		(28.95)	
Miles of Proposed Activities		74.78	
Total Miles of Final Trail System			44.08

*This number is higher than the number in the 30-day comment period proposed action. In that comment period proposed action only the social trails planned for conversion were included not the social trails planned for obliteration.

Table 2: Summary of Road Mileages for the No Action and Proposed Action Alternatives
(Mileages are only on NFS lands)

Roads	Alternative A: No Action (existing condition)	Alternative B: Proposed Action	
Existing Roads Open to Motorized Use	18.27		
Roads for Forest Service Administrative Use Only (Not Available for Public Use)	1.32		
Roads Not Available for Public Use (includes decommissioned, closed, and private roads)	3.93		
Total Miles of Existing Roads	23.52		
Existing Roads (no action)		15.76	15.76
Roads for Forest Service Administrative Use Only		2.41	2.41
*Road Converted to System Trail		(4.11)	
*Road Decommissioned/Obliterated		(1.24)	
Miles of Proposed Activities		23.52	
Total Miles of Final Road System			18.17

*Some of the road mileage is currently closed to public use

Table 3: Existing and Final Trail and Road System Mileages and all other ownerships added

	Alternative A: No Action (existing condition)	Alternative B: Proposed Action	Alternative B with County and Private Mileages*
Trails			
Total Miles of Existing System and Social Trails	61.73		70.99
Total Miles of Final Trail System		44.07	49.05
Roads			
Total Miles of Existing Roads	23.52		32.83

Total Miles of Final Road System		18.17	27.09
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*Miles included on County and private lands only include existing trails, not future planned trails.

DESIGN CRITERIA FOR ALTERNATIVE B: PROPOSED TRAIL SYSTEM

In addition to the trail design guidelines described in the Proposed Action in the preceding pages, the following project design criteria have been developed during the planning process and will be applied to Alternative B-Proposed Action, if it is selected. These design elements are necessary to ensure that implementation of the selected alternative complies with laws, policies and the *Forest Plan*. The intent of these design criteria is to avoid, reduce or minimize resource effects related to project implementation.

General:

- Pursue a collaborative approach to trail layout, utilizing input from user groups, landowners and other agencies.

Cultural Resources:

- When project implementation occurs (ground disturbances during trail construction; Forest System and social trail obliteration; trail reroutes; and conversion of some roads to official trails) the designs are flagged on the ground, a Class III Cultural Resource Inventory will be completed in consultation with the Colorado State Historic Preservation Office (SHPO) prior to project implementation. Implementation will not begin until the SHPO has concurred with a determination of *no historic properties affected* or *no historic properties adversely affected*.
- National Historic Preservation Act (NHPA) Section 106 consultation will be negotiated with the appropriate agencies (the Colorado State Historic Preservation Office (SHPO); the Tribal Historic Preservation Officer(s) (THPO); the Advisory Council on Historic Preservation (ACHP); and/or other interested consulting parties) prior to implementation (in accordance with 40 C.F.R. 1500-1508).
- If ground disturbing activities are required for any project activity, then all NRHP eligible or unevaluated sites within project area (including the known historic property 5GL2048.1) will be buffered by 50 feet and flagged on the ground for avoidance during implementation. No ground disturbing activities will occur within these flagged areas, unless determined to be appropriate by the Project Archaeologist in consultation with State Historic Preservation Office (SHPO).
- All trail and road improvement, construction, deconstruction, decommissioning, or rerouting, will be surveyed for cultural resources prior to implementation and receive concurrence with the SHPO on a determination of No Adverse Effects or No Historic Properties Adversely Affected.
- Previously undiscovered sites encountered during the course of project activities will be avoided until they can be evaluated by an archaeologist. If affected properties are

discovered after project activities are completed, the Forest will document any damage and consult with SHPO and Council pursuant to 800.13(b).

- **Inadvertent Discovery:** The Boulder Ranger has been informed of the recommendations above. If additional prehistoric or historic materials are found during the course of this project, work in that area will cease until the District Ranger has been notified. Work in the area of the cultural resource may not resume until a professional archaeologist has evaluated the cultural materials and potential effects. The discovery must be protected until notified in writing to proceed by the authorized officer (36 CFR 800.110 & 112, 43 CFR 10.4).
- If so requested by the SHPO or an Indian Tribe, the Forest will conduct additional consultation for the identification of properties of traditional cultural and religious significance to Indian Tribes or other interested parties. Additional mitigations may be required if areas or sites are determined to be of importance to an Indian Tribe.
- **Pre-Implementation Survey:** If any new actions are planned that were not specifically identified in this report, an archaeological assessment is required since additional cultural resource surveys may be needed.

Invasive Plants:

- To minimize risk of noxious weed introduction and spread, require all equipment to be used for ground-disturbing activities for this project (not including service trucks or other vehicles that remain on roadways) to be clean, i.e., free of mud, dirt, plant parts, and seeds, or other debris that could contain or hold seeds, prior to entering the project area. Trail building equipment will be considered free of soil and other debris when a visual inspection does not disclose such material.
- For known weed occurrences and for any new noxious weed infestations found in or near impact areas prior to implementation, implementation personnel will coordinate with the District Invasive Plants Coordinator to implement appropriate prevention measures, such as avoidance, treatment of weeds prior to implementation, and/or additional equipment cleaning requirements, such as between infested and uninfested areas.
- Coordinate with District Invasive Plants Coordinator to locate staging areas, and other areas of severe soil disturbance to best reduce risk of spread of invasive plants.
- As soon as possible after trail building or obliteration are complete, reclaim disturbances by a combination of covering them with slash and raking in dirt and duff from adjacent areas and revegetation where needed.
- Consult with a Forest Service botanist regarding government furnished seed if revegetation will occur.
- Use only seed free material such as native slash and “Wood Straw” for mulching

Plants:

- Prior to implementation, the project botanist and or botany technicians will survey for Region 2 sensitive plant species identified as having possible habitat. If Region 2 sensitive plant species are observed within the area to be impacted by the project; the project botanist or botany representative will work with the recreation staff to avoid all observed occurrences.

- Trail restoration activities will be coordinated with the project botanist.

Soil and Water Resources:

Trail Alignment and Design:

- Design stream crossings to minimize sedimentation and/or direct impacts
- Minimize “fall line” alignments
- As a general guideline, maximum trail grade should be 15 percent (except for natural or built rock structures). Average trail grade should stay under 10 percent (with grade reversals)
- Follow the half-rule to the extent possible. A trail's grade shouldn't exceed half the grade of the side-slope.
- Minimize alignments through completely flat areas where few drainage options exist the hillside
- Apply cross drainage as frequently as needed to minimize erosion of the trail tread. Techniques include out-sloping where possible, dips and water-bars
- Armor trail tread if/where needed. For highly technical trails where grade will sometimes exceed 15 percent, use natural rock, rock armoring or other rock features to add challenge and improve sustainability
- Specify and maintain recommended trail widths
- Minimize trail alignments within or directly adjacent to inner gorges, riparian vegetation zones, wetlands or stream channels
- Consult US Forest Service Watershed personnel for review of trails with potential to impact soils and water resources
- Trail/stream crossing will be constructed to limit erosion and avoided if at all possible

Trail/Area Regulations and Signing:

- Apply area seasonal closures throughout the road and trail system and enforce when soils are excessively wet (usually in the spring after snow melts or if there are excessive rain events during the later summer monsoon season)

Trail Obliteration and Restoration:

- Re-contour and de-compact for natural appearance and improved watershed function
- Control erosion through creating hummocky micro-topography and re-establishing ground cover through mulching with US Forest Service approved imported materials and/or forest litter/duff, slash or downed logs
- Re-vegetate according to plans and/or design criteria approved by USFS personnel
- Consult US Forest Service Watershed and Botany personnel to provide input for restoration plans and activities

Wildlife:

- Prior to building new trails or rerouting or obliterating existing trails, consult with a Forest Service wildlife biologist for a determination of surveys needed. Results of surveys and/or

observations during implementation, such as breeding activity of amphibians or other wildlife or active bird nests of any species, may result in timing adjustments for trail work, seasonal closures, or adjusting trail locations.

- Prior to building new trails or rerouting or obliterating existing trails, consult with a Forest Service wildlife biologist regarding any construction timing restrictions needed to avoid or minimize impacts to wildlife during critical periods/activity, for example spring or fall elk migration.
- During trail reroutes and new trail construction, where possible route trails to allow retention of existing snags that do not pose a safety hazard to trail users, especially snags 10" dbh or greater and snags with cavities.
- In consultation with a Forest Service wildlife biologist, where possible, route trails near the edges of patch cuts and clearcuts, and away from large bordering forested stands, to reduce disturbance to wildlife.

2.3 Alternatives Comparison

The following table is designed to compare the elements of the alternatives.

Table 4: Components of the Two Alternatives

	Alternative A: No Action (existing condition)	Alternative B: Proposed Action
Trails		
Total Miles of Existing System and Social Trails	61.73	
Total Miles of Final Trail System		44.07
Roads		
Total Miles of Existing Roads	23.52	
Total Miles of Final Road System		18.17
Trailheads		
	2 (no toilet facilities or horse trailer facilities)	2 (both with toilet facilities and 1 with horse trailer facilities)
Signing		
	Some Signing	Additional and improved signing
Regulations		
	Mountain bike and equestrian use would not be restricted to trails and roads	Mountain bike and equestrian use would be restricted to trails and roads. Cross-country travel by mountain bike or horse would not be allowed. (Incidental off-trail use for picnicking and other incidental uses would be allowed.)
	Alternative A: No Action (existing condition)	Alternative B: Proposed Action
	Snowmobiles would not be prohibited within the project area	Snowmobiles would be prohibited within the project area
	No Winter grooming is allowed	Winter grooming for Nordic and fat tire use would be allowed under a Forest Service authorization on approximately 4 miles of existing roads
Adaptive Management		
	No	Yes
Private Lands		
	Pursue legal access across private lands	Pursue legal access across private lands

Table 5: Effects Comparison of Alternatives

Issues	Alternative A No Action	Alternative B Proposed Action
Recreation – Non-Motorized; Motorized; Winter Motorized and Manageability	Unsustainable trail system and resource degradation continues	A trail system that is well designed and sustainable would be achieved as the project is implemented
	Difficult to manage trail system	Trail system becomes more easily managed
	Social trails continue to proliferate	Social trails would be actively decommissioned
	Navigation difficult due to lack of signing leads to trail user frustration	Improved navigation due to better signing, leading to a higher quality recreation experience
	No improved safety	Signing will improve safety for trail users, leading to a higher quality recreation experience
	Continuing user conflicts	Decreased user conflicts
	No direct access points to Nederland	Nederland enhancement with better access points
	No regional connection to other trail systems	Regional connection to the west to the proposed Boulder County Toll Conservation Easement Trail. Additional connections in the East Magnolia Zone as the County develops its trail system
	No winter grooming allowed for non-motorized winter recreation	Winter grooming allowed for non-motorized winter recreation, enhancing winter recreation
	Landowners with permits to snowmobile into their property would continue	Landowners with permits to snowmobile into their property would continue
	Minimal winter motorized use would continue	Winter motorized use would not be allowed, but because the use is minimal, is expected to have minimal impact on winter motorized recreation users
	No adaptive management	Adaptive management allows more efficient resource/management response time to changing trail conditions, improving the sustainability of the trail system
	Bicycle and horse riders could continue to go off trail, creating resource damage and more social trails	Bicycle and horse riders would not be allowed off trail reducing resource damage
	Physical Trail Sustainability -- Soil, Water and Invasive Plants	No restoration of disturbed ground
Trail system would not be sustainable and social trails would continue to be used and more would proliferate negatively impacting resource conditions (soil and water).		The trail system would be design and built to be sustainable improving impacts to the soil and water resource. Social trails would be decommissioned which maintains or improves resource conditions.
No benefits would be realized due to a lack of an adaptive management component.		Ability to respond to changing conditions. Benefits would be realized from a responsive monitoring, maintenance, repair and restoration adaptive management program.
Invasive plants could be spread further by the expanding social trails and off trail use. Design criteria and the ARP weed management		Construction activities could introduce new invasive plants in the short term, but an overall decrease in trail mileage, obliteration of social trails, and prohibition of off-trail use by bicyclists

	program would continue to aid in minimizing invasive weed spread.	and equestrians would reduce the further spread of invasive plants. Design criteria and the ARP weed management program would also aid in minimizing invasive weed spread.
Wildlife-- Habitat, Elk Migration	Habitat effectiveness is not consistent with Forest Plan direction with no trend for improvement.	Habitat effectiveness, though not meeting Forest Plan direction is improved.
	Encroachment into interior forest patches would continue and potentially expand as new social trails are created	Encroachment into interior forest patches could be incrementally reduced by the closure of some existing system and social trails.
	Forested corridors would remain the same	Forested corridors would remain the same
	Travel route density is above the recommended density	Travel route density is above the recommended density but would be reduced by 25%.
	Proliferation of social trails and cross-country travel negatively impacts wildlife by expanding use across a larger area and is an unpredictable activity.	Restricting bicyclists and equestrians to designated trails limits impacts to wildlife by concentrating these uses to the system trails making it more predictable to wildlife
	No benefits would be realized due to a lack of an adaptive management component	Adaptive management provides for seasonal trail closures, and closures to prevent additional snow compaction in lynx habitat
Other Issues	Alternative A No Action	Alternative B Proposed Action
Threatened, Endangered, and Sensitive Species and to Management Indicator Species		
Wildlife	Threatened, Endangered, Proposed Species The finding for Canada lynx is <i>"may affect, not likely to adversely affect."</i>	Threatened, Endangered, Proposed Species The finding for Canada lynx is <i>"may affect, not likely to adversely affect."</i>
	Forest Service Sensitive Species The finding for Forest Service Sensitive Species analyzed varies between "No Impact" and <i>"May adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing."</i>	Forest Service Sensitive Species The finding for Forest Service Sensitive Species analyzed varies between "No Impact" and <i>"May adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing."</i>
	Management Indicator Species The finding for all Management Indicator Species analyzed, including elk and mule deer, is <i>"No change to Planning Area (ARNF) populations."</i>	Management Indicator Species The finding for all Management Indicator Species analyzed, including elk and mule deer, is <i>"No change to Planning Area (ARNF) populations."</i>
Fish	Threatened, Endangered, Proposed Species The finding for greenback cutthroat trout is "no effect"	Threatened, Endangered, Proposed Species The finding for greenback cutthroat trout is "no effect"
	Forest Service Sensitive Species The finding for Forest Service Sensitive Species analyzed varies between "No Impact" and <i>"May adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing."</i>	Forest Service Sensitive Species The finding for Forest Service Sensitive Species analyzed varies between "No Impact" and <i>"May adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing."</i>
	Management Indicator Species The finding is "No change to Planning Area (ARP) populations"	Management Indicator Species The finding is "No change to Planning Area (ARP) populations"

Plants	<p>Threatened, Endangered, Proposed Species There are none in the project area</p> <p>Forest Service Sensitive Species The finding is “No Impact”.</p> <p>Management Indicator Species There are no plant MIS for the ARP.</p>	<p>Threatened, Endangered, Proposed Species There are none in the project area</p> <p>Forest Service Sensitive Species The finding is “No Impact”.</p> <p>Management Indicator Species There are no plant MIS for the ARP.</p>
Cultural Resources	No effects to cultural resources are anticipated due to design criteria.	No effects to cultural resources are anticipated due to design criteria.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

3.1 Introduction

This chapter describes the existing condition of the area (affected environment) and the environmental effects of the alternatives on the resource area as they relate to the issues. It should be noted that each full resource report is located in the project record. Each resource section contains a description of the current/existing condition of the resource. This description of the existing condition is the description of the No Action Alternative. Each resource section includes a discussion of the environmental effects including the direct, indirect, and cumulative effects associated with either the No Action or Proposed Action Alternatives.

Direct effects are caused by the action and occur at the same time and place as the action taken. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (i.e., likely to occur within the life of the project).

Cumulative effects are the effects on the environment which results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future action's effects regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. (40 Code of Federal Regulations 1508.7, NEPA Implementation Regulations)

Projects which could lead to cumulative effect are listed below. Not all of these projects apply to each resource.

Past or Current Actions

Historic mining
Water diversions
Caribou (2005)
Lump Gulch Fuels Reduction Project (2009)
Private Property Defensible Space (2003)
Winiger (2000)
Caribou-West Magnolia Travel Mgmt (2003)
Hazard Tree EA (2010)
Forsythe (2012/2014)
Toll Property Conservation Easement (2015)
Nederland Water Treatment Plant (2012)
Jenny Creek Watershed Project (2014/15)
Eldora Ski Area EIS (2015)
Existing Public/Private Road and Trail System
Current Outfitter/Guides (1 equestrian & 1 mtn biking)
Private property development surrounding Nederland
Expansion of the community of Nederland

Future Actions

Forsythe II
Toll Trail Easement Construction to Boulder County
Boulder County Reynold's Ranch Fuels Project
Boulder County Reynold's Ranch Trails System Project
Big Springs Subdivision Egress Project
Future Outfitter and Guide permits
Gross Reservoir/Denver FERC License Amendment
Increasing population along the Front Range of CO
Increasing mountain subdivision development
Natural disturbances such as insect and wildfire

3.2 Recreation

Issues for Analysis:

Recreational Use of the Project Area:

- a. Non-motorized recreation use could:
 - i. Cause conflicts among users (private landowners, equestrians, hikers, mountain bikers, campers, hunters, and motorized users).
 - ii. Provide opportunities for select recreational users and not others.
 - iii. Cause the trails to deteriorate by overuse or inappropriate use.
- b. Motorized wheeled recreation use of roads could:
 - i. Be affected by elimination or conversion to trails, segments of motorized roads.
- c. Motorized snowmobile recreation use could:
 - i. Be affected by elimination of snowmobiling in the project area.
- d. The proposal to improve the current non-motorized trail system would not improve the Forest Service's ability to manage the trails and enforce regulations in the area. A lack of funding and personnel exacerbate this issue.

Alternative A – No Action: Existing Condition

The majority of the project area is located in the Lump Gulch Geographic Area, as described in the *1997 Forest Plan* (pp 81 - 83), which contains a mix of lower and upper montane and subalpine plant communities consisting of aspen, Douglas-fir, limber pine, lodgepole pine, ponderosa pine, Engelmann spruce, subalpine fir, and meadows. Elevations range from 7,600 to 10,929 feet.

Over the past several years, population growth in the adjacent urban areas and the popularity of outdoor recreation have led to a substantial increase in recreation use across the Boulder Ranger District and in this project area, specifically. This increased use has led, in part, to resource damage, unmanaged recreation use, and an increase in the need for both maintenance and compliance enforcement for the existing recreation opportunities in the project area. The project area is easily accessible from Denver and its surrounding Front Range communities. The trail system, which is designated for only non-motorized uses is currently open year-round and most use occurs between late spring and late fall.

Following recent fuel treatments, the strategy for the management of the trail system within the project area has included agency planning efforts supported by agency partnerships. One such effort culminated in the *Proposed West Magnolia Trail System Master Plan* (June 2014).

This report has been considered along with numerous other forms of public comment to reach the proposed action presented in this EA document. Public involvement in this planning effort is more completely outlined in Chapter 1 of this EA and merely mentioned here to support this section.

Existing Non-motorized use

There is a large network of both system and social trails and dispersed camping opportunities within the project boundary. The current trail system within the project area is designated non-motorized and is very popular for hiking, running, horseback riding, and mountain biking, with the predominant activity throughout the project area being mountain biking. This aligns with previous District recreation management direction in the Caribou-West Magnolia Travel Management Environmental Assessment (EA) 2003, which identifies the West Magnolia trail system as the recommended location on the District for mountain biking. These opportunities are supported by Forest Plan guidance.

Within the project area there is a large network of social trails. While the action of creating unauthorized social trails on Federal lands is illegal, the use of said trails is not illegal, per se, unless further resource damage can be proved. District knowledge of the expansive social trail system within the project area has revealed that many social trails have been built by both motorized and non-motorized recreation users. The exact mileage is variable as social trails can persist for years or become obsolete in a single season. Through various means of District observation and resources, the location of social trails are documented and updated as time permits. The persistence of social trails within the project area presents the District with management challenges for this unmanaged recreation use while suggesting an unmet recreational need for the recreating public. Management experience reveals that social trails are frequently poorly designed with steep grades and as such are rarely sustainable under increased use with subsequent resource degradation often being severe.

The decision on the 2003 Caribou-West Magnolia Travel Management EA designated the current non-motorized trail system and dispersed campsites. The majority of actions identified in that plan have been completed. Since that time, some of the trails within the project area were negatively impacted as a result of recent fuels reduction work that occurred in the area to reduce wildfire risk and remove infested and dead trees due to the mountain pine beetle, including the Lump Gulch Fuels Treatment EA (2009) and Forsythe Fuels Treatment EA (2013). These treatments which included cut areas of one to 40 acres in size opened up the tree canopy which had covered these wooded trails, thus reducing the intimate recreation experience.

Among the existing non-motorized uses are two outfitter and guide permits within the project boundary (Sundance Stables and Single-Track Mountain Bike Adventures) and one organizational camp (YMCA of Boulder Valley). Sundance Stables is authorized for horseback rides on NFS trails/roads in the West Magnolia zone; west of the Peak to Peak Highway, and north and south of County Road 132W. Single-Track Mountain Bike Adventures is authorized for mountain biking within the West and East Magnolia zones on NFS trails/roads. The YMCA of Boulder Valley is an organizational camp that covers approximately 3.8 acres in the West Magnolia zone, in the southwest ¼ of Section 23, Township 1 South; Range 73 West.

Boulder County has acquired a trail easement through the Toll property in the South Magnolia zone of the project area. Boulder County is in the planning phase of trails in the Reynolds Ranch area in the East Magnolia zone.

Existing motorized non-winter use

Motorized use within the project area is currently permitted on the NFS roads identified on the Motor Vehicle Use Map, which totals slightly over 18 miles (open to the Public) on NFS land. NFS trails are currently designated for non-motorized use under the direction of the *Forest Plan* and further supported by the Caribou-West Magnolia Travel Management EA and Decision Notice (2003). It is recognized within the project area, predominantly within the West and South Magnolia zones, that illegal motorized use, by primarily dirt bikes and All-Terrain Vehicles (ATVs), occurs on the existing system and social trails despite education (websites, kiosks, partner groups, and seasonal patrol contacts) and enforcement attempts to alert the recreating public to existing prohibitions. In part, this use occurs due to trail system navigability issues, including the proliferation of social trails within the project area. Motorized users also access Forest lands via the existing road system during the various hunting seasons.

Existing motorized snowmobile winter use

Winter snowmobile use within the project area currently registers minimal use and is not a destination activity within the project area, largely due to inconsistent snowpack and limited access points and trailhead parking for snowmobile trailers. At higher elevations within the project area where snowpack is more consistent, Lynx habitat within the Lynx Analysis Unit (LAU) prohibits snow compaction at rates typically exceeded by over snow vehicles. The primary snowmobile use is by special use permit for landowners to gain access to their property within the project area in the winter when roads are closed and unmaintained for winter travel. Currently there are four gates within the project area west of the Peak-to-Peak Highway that are closed seasonally for the winter from December 1 through May 14 per the Boulder Ranger District Motor Vehicle Use Map (MVUM).

Existing manageability of non-motorized system and enforceability of regulations

The current National Forest System Trails (NFSTs) have sections of unsustainable alignments causing resource impacts and requiring maintenance for the increased use they are experiencing. Maintaining unsustainably designed roads and trails requires more resources than maintaining sustainably designed roads and trails. Additionally, social trails have been and continue to be built on Forest lands. They usually connect to system trails within the project boundary. Resource impacts continue to increase due to this unmanaged recreational development and use of these social trails. Social trail proliferation is likely the result of general increased recreational use of the area and suggests insufficient recreational opportunities within the project area. Addressing unmanaged recreation use over the long-term requires a balanced management strategy that is both agency compliant and recognizes the challenge of

meeting the Forest Service's mission of both caring for the land and serving the public. In the short-term, education and enforcement strategies are in place for addressing unmanaged recreation use within the project area, this currently includes active involvement from both recreation partnership/volunteer groups and county law enforcement support.

Regarding current manageability of the existing trail system, almost half of all respondents from a 2013 survey done during the analysis phase for the *Proposed West Magnolia Trail System Master Plan*, expressed difficulty navigating the existing trail system, in part due to social trail proliferation, lack of signage, and irregular trail junctions. Concern over navigability exists not only for improving the public recreational experience but also for public health and safety concerns. These concerns include but are not limited to: lost visitors, injuries associated with the use of socially constructed trails, and private lands trespass onto properties with potentially dangerous historic mining operations located on them that exist within the project boundary.

Alternative A – No Action: Environmental Effects

Direct and Indirect Effects

Management of the trail system in the project area would remain under its current management. No changes to the trail system would take place and trail improvements or realignments for existing system trails would fall under general maintenance project work. There are no design criteria, adaptive management or monitoring activities for Alternative A because there are no new actions under this alternative.

Non-motorized use

It is expected that a proliferation of social trails would continue across the project area as recreational demand increases. Management experience reveals that social trails are frequently poorly designed with steep grades and as such are rarely sustainable under increased use with subsequent resource degradation often being severe. Erosion from social trails and unsustainable system trails would continue. User conflicts over navigability of the trail system and between different types of users may continue.

The effects from past fuel treatments on the existing system trails would be more difficult to address. They include but are not limited to the following, as identified in the *Proposed West Magnolia Trail System Master Plan* (June 2014) page 24:

- **Operational Impacts:** In places, logging operations obliterated the tread or obstructed the tread with debris. Some trails were used as roads and their conversion back to trails in places displays a significantly widened bench, in-sloped drainage, poor trail character and/or rely on piles of slash to define a tread.
- **Reduced Canopy:** Where little to no tree canopy now exists, precipitation (especially summer thundershowers) is expected to create more splash-erosion, concentrate runoff volume (not dissipated by canopy) and hasten trail erosion. Without screening wind

is expected to more readily transport any loosened soil, hastening erosion. These unbuffered erosion forces would likely exploit segments of trail with existing cupping, exceeding grades, un-cohesive soils or lack of drainage and cause tread treatments (i.e.: RGDs, deberming, etc) to have shorter effective lifespans.

- **Lack of Anchors:** Some existing trails derive a tight, twisty character by weaving around and between dense tree stands. The trees help anchor the tread and keep users on the trail alignment. In areas now devoid of trees and with open sightlines, such twisty trails are likely to feel contrived and shortcutting is expected. Similarly, erosion treatments such as armoring and retrofitted grade reversals that typically rely on such anchors to keep users on the treated tread may be less effective.

The two outfitters, Sundance Stables and Single-Track Mountain Bike Adventures, and the organizational camp, YMCA of Boulder Valley, operations would be unaltered by the No Action Alternatives.

No additional regional trail connectivity would occur with the Toll Conservation Easement Trail that Boulder County is proposing, nor would any additional connectivity be achieved in the East Magnolia zone or east of the project area.

Motorized non-winter use

It is anticipated that illegal motorized trail use would continue within the project area and remain a management challenge.

Motorized recreation on the 18 miles of NFS roads would remain unchanged. Hunting access would remain unchanged.

Motorized Snowmobile winter use

Under the no action alternative, it is anticipated that minimal snowmobile use would continue within the project area. Landowners with special use permits would still be able to access their property within the project area in the winter when the roads are closed per the MVUM and unmaintained for winter travel. The seasonal closures on the roads would remain in place.

Manageability of non-motorized system and enforceability of regulations

The ability to manage the resource concerns related to existing unmanaged recreational use would continue to provide a challenge to agency personnel and the partner groups and county law enforcement resources that assist with education and enforcement actions. Social trails, would continue to cause resource impacts as a result of generalized increased use and unmet recreational opportunities within the project area. Funding would be spent to manage an unsustainable trail system. This would not be an efficient use of scarce funds.

Trail user frustration over the navigability of the current system trails would likely continue with no new signing on-the-ground. Lack of signing would exacerbate social trail proliferation, due to confusion by the trail user to stay on the designated, but unsigned trail.

Trail junctions and intersections that currently do not align would not be rerouted without additional planning action.

Cumulative Effects

Recent trends assessed with field observations suggest that as the front-range population increases, demand for recreational trail opportunities would increase and there would be an increase in conflict among recreation users and outfitter and guides as they compete for opportunities within the project area. By not addressing unmanaged recreation use in the project area, it can be expected that resource damage and unmet recreational needs would perpetuate. Opportunities to connect the Forest Service trail system to neighboring land agency trails, including a regional connection from the South Magnolia zone with the Toll Conservation Easement Trail to the west of the project area and Boulder County's Reynolds Ranch Open Space area in the East Magnolia zone of the project area would not be made. Additionally, trail connections to the local community of Nederland would be minimal.

Additional fuel treatments, including the proposed Forsythe 2 project, would have direct impacts on the recreational opportunities in the East Magnolia zone of the project area. The expected effects from future fuel treatments would add a broader area of effects to those described in the above direct/indirect effects analysis from past fuel treatments. Trails would not be relocated if they pass through tree cutting units.

As outlined above, the no action alternative would not allow for more immediate management actions to be taken to respond to changes in the physical landscape or social dynamics within the project area over time, because adaptive management practices would not be in place for the project area. Due to past fuel treatments, including the Lump Gulch Fuels Treatment EA and Decision (2009) and Forsythe Fuels Reduction EA and Decision (2013), this current planning process was undertaken to address the changed conditions due to vegetation removal. Without the quicker response due to adaptive management, continuing problems with soil erosion and wildlife displacement or disturbance and deterioration of the overall recreation experience would continue.

The Forsythe II project proposes two emergency egress roads from the Big Springs subdivision (south of Barker Reservoir) to the Magnolia Road. These egress roads to be managed under a special use permit could be locked on both ends to prevent use of the roads by motor vehicles, but would be opened to non-motorized use. However, these roads, if approved, could be built with a width of 30 feet. One of the proposed egress roads would be overlaid on a portion of NFST 853 (.1 mile) and overlaid over the entire 853.1B (.7 mile). This could negatively affect the non-motorized experience on these two trails.

Alternative B - Proposed Action: Environmental Effects

Direct and Indirect Effects

The proposed action would establish a sustainable non-motorized trail system in the project area that aims to maintain the existing natural character of the current trail system. The Forest Service proposes to re-route some existing trails, create new trails, close system and social trails, and convert some portions of roads and social trails to system trails. Additional proposed actions include:

- Equestrian and bicycle users would be restricted to designated trails.
- All new social trails created after the decision of this analysis would be obliterated.
- Snowmobiles would be prohibited within the project area for resource protection.
- Winter grooming for Nordic skiing, snowshoeing, and fat tire bike use would be allowed under a Forest Service authorization on approximately 4 miles of existing roads.

This proposed action includes an adaptive management component to allow for changes to be made across the trail system as it is developed and used. These changes could be as a result of the environmental landscape (e.g., climate, wind events, floods, wildlife movement) being affected; or as a result of the functioning of the trails (both summer and winter), either from an ecological sustainability or recreation management perspective; and the effects of winter recreation use on lynx habitat.

Under Alternative B, the proposed trail system changes allow for optimizing trails, both now and through potential future management actions under the adaptive management guidelines within this planning document. Specific to optimizing mountain biking trails, the Deschutes National Forest: Mountain Bike Trail Standard: Tiered to FSH 2309.18 23.13 Bicycle Design Parameters document is being included in the project record as a recommended trail design reference for the future development of new trails and the re-routing and retro-fitting of existing trails (see Appendix D).

The proposed action map (Map 6, Appendix A) shows what action would be taken on each individual trail and road. Appendix B lists the proposed action for each individual trail and road. Social trails not identified on the map would not be included as system trails and would be scheduled for obliteration. All new social trails created after the decision of this analysis would be scheduled for obliteration.

Non-motorized use

Non-motorized Recreation Use Could (from identified issues):

- i. Cause conflicts among users (private landowners, equestrians, hikers, mountain bikers, campers, hunters, and motorized users).
- ii. Provide opportunities for select recreational users and not others.
- iii. Cause the trails to deteriorate by overuse or inappropriate use.

The proposed action would increase system trail mileage and expand opportunities for non-motorized users of all user groups. As shown in Table 1, system trail mileage would increase from approximately 16 miles to 44 miles. It should be noted that the total trail mileage in the project area, including system and social trails, would decrease from approximately 62 miles to 44 miles. Alternative B includes proposed actions to better reduce potential conflict between user types by providing an increase in overall system trail mileage, improving system navigability, and enhancing the existing character and challenge of the trails. These actions incorporate building and maintaining trails in a sustainable manner to minimize negative environmental effects created by erosion from natural precipitation patterns as well as increased recreational use. A focus on sustainable design would preserve the recreational experience of the trails. Specific environmental, resource, and social triggers are in place for adaptive management alternatives should conditions warrant.

Current and proposed system trails with junctions that cross NFS roads would have adequate signage as required by Forest policy and would be installed to prevent conflict with motorized road use. Additional signage, to the minimal extent necessary, of all new and existing system trails would be installed to eliminate conflict and navigation confusion among trail users. The effect of these actions would increase public safety. Regarding the proposed conversion of Social Trail 2 and Social Trail 4 to system trails, these provide desired access from the Town of Nederland to both the East and West Magnolia zones without requiring the need for a pedestrian crosswalk to cross the scenic and busy Peak-to-Peak highway. The intent of these trails are to provide access points into the system without designating them as trailheads with dedicated parking. Parking from non-local users would be expected to occur within the Town of Nederland, at a designated Forest Service trailhead, or as allowed by state law on public roadways.

Current system trails within the project area are not open to motorized use and, therefore, do not affect that specific user group from any proposed change in Alternative B-Proposed Action. Recommended Forest Plan summer and winter strategies for motorized use within the project area are consistent with the proposed action. Therefore a conflict between non-motorized and motorized trails riders is not expected to be a concern as the proposed action is implemented over time.

It is anticipated that education and enforcement would be expected for any proposed actions that change existing use patterns and regulations. As such, any prohibited actions within the project area would be subject to education and enforcement efforts from a variety of agency personnel, including officially recognized volunteer/partner group patrols and county sheriff deputy patrols. A supplemental goal of educational efforts is to promote and encourage public user's self-interest in the stewardship of public lands through formal and informal opportunities to educate fellow public users of their public lands.

The two outfitters and guides', Sundance Stables and Single-Track Mountain Bike Adventures, and the one organizational camp's, YMCA of Boulder Valley, operations could be enhanced by trail improvement from this alternative.

Motorized non-winter use

The proposed action would reduce miles of NFS roads from approximately 18 miles to 16 miles (see Table 2). The road actions being proposed include conversion to trails, designation for administrative use only, and small segments of roads planned to be decommissioned and obliterated. The minimal loss of mileage for public motorized recreation within the proposed road system has a negligible effect on recreation opportunities in the area, in part, because of the redundancy of roads nearby (FR 355.1H, FR105.2B) and non-existing current motorized use (roads in East Magnolia zone). Additionally, roads proposed to be closed or converted to trail in the South Magnolia zone meet private landowner concerns and neighboring land agency management objectives as these roads currently cross or dead-end on private property (NFS Roads 512.1, 512.1A, 109.1, 109.1C, 105.1A/B/C, and 503.1). Appendix B lists the proposed action for each individual road.

Motorized Snowmobile winter use

The proposed action would affect all winter motorized use within the project area other than use under an administrative or special use permit. The resulting effect on recreational opportunities is minimal as snowmobiling currently registers minimal use and is not a destination activity within the project area, largely due to inconsistent snowpack and limited access points and trailhead parking for snowmobile trailers. The proposed action to eliminate snowmobiling and any other winter motorized use within the project area is consistent with Forest Plan winter travel management strategy (“not emphasized”) for the Lump Gulch Geographic Area which covers the majority of the affected project area. Additionally, current agency direction for lynx habitat would preclude snowmobile activity within the Lynx Analysis Unit (LAU) due to snow compaction limitations. The LAU includes the western portion of both the West and South Magnolia zones.

Manageability of non-motorized system and enforceability of regulations

Public concern over the proposed action to improve the current non-motorized trail system suggested that it would not improve the Forest Service’s ability to manage the trails and enforce regulations in the area as a lack of funding and personnel exacerbate this issue.

The proposed action, however, does improve the Forest Service’s ability to manage the trails and enforce regulations in the area. The Proposed Action would reduce the unmanaged recreational use currently happening on social trails: by providing additional trail mileage; addressing unsustainable segments of existing system trails; eliminating social trail that currently exist or would be developed in the future; increasing the navigability of trails and eliminating off-trail use by bicyclists and equestrians within the project area. Additionally, implementation of system trails with a sustainable design strategy reduces the maintenance intervals needed to maintain the system and increases the overall quality of the trail alignments. Partner organizations motivated by the new opportunities have expressed interest in supporting the management of the area with both funding and public educational efforts. The significant engagement by local partnership groups and volunteers to implement the

proposed action has been recognized throughout the planning process and is anticipated to remain significant throughout any approved implementation activities based on the consistency of these partnerships to date. Survey results showed a majority of respondents had participated in volunteer activities throughout the county within the past year. These activities can range from on-the-ground project work to partner organization board members that actively pursue funding sources (grants, etc.) in relation to agency goals. These partnership groups and volunteers would supplement Forest Service educational presence along with the additional county law enforcement support currently occurring. Additionally, partnership and volunteer groups would be able to provide input into the Forest Service developed implementation strategy that would guide the project to completion.

Adaptive Management

The goal of the adaptive management triggers is not to reduce recreational opportunity but to allow for more immediate management actions to be taken to respond to changes in the physical landscape or social dynamics within the project area over time.

Having adaptive management strategies reviewed and in place allows for a more efficient response to changing conditions within the project area. A quicker response can minimize effects to soil erosion and wildlife displacement or disturbance. With a quicker response to resource damage, it is likely that less funds would be required to fix the trail damage versus letting the damage worsen, becoming a bigger problem requiring more money to fix.

Cumulative Effects

Dispersed camping, recreational target shooting, and unauthorized occupancy on lands within the project area are all activities that fall outside the scope of this planning effort, but are activities that are recognized as having cumulative effects on the recreational experience being proposed by this planning process. Those activities on their own accord have been identified as a Forest Service concern and are being actively addressed by other Forest planning efforts. There may be cumulative effects that result on the non-motorized trail system within the project area as a result of decisions made about dispersed camping, recreational target shooting, and unauthorized occupancy on lands within the project area. These effects could have a positive or negative effect on the trail user's experience, however, any decisions that are made would be in accord with overall policy direction concerning recreational opportunity and resource protection.

The past fuel treatments within the project area affected the recreational experience of trail users. Addressing this changed experience became one of the needs for this current Magnolia Trails EA. Additional fuel treatments, including the proposed Forsythe II project, would have cumulative impacts on the recreational opportunities in the East Magnolia zone of the project area. As such, implementation of proposed trail actions in the East Magnolia zone would be planned for implementation after fuel treatments have occurred. The expected effects from future fuel treatments are similar, but on a broader scale, to those described in the fore-mentioned effects analysis from past fuel treatments. Adaptive management practices that would be established by this alternative would enable more efficient responses to future actions, including vegetation treatment, to minimize effects to all pertinent resources. Having

an adaptive management process would be beneficial to react to any future Forest Service actions.

Two emergency egress roads from the Big Springs subdivision (south of Barker Reservoir) to the Magnolia Road are proposed in the Forsythe II project. These egress roads (to be managed under a special use permit) could be locked on both ends to prevent use of the roads by motor vehicles, but would be opened to non-motorized use. However, these roads, if approved, could be built with a width of 30 feet. One of the proposed egress roads would be overlaid on a portion of NFST 853 (.1 mile) and overlaid over the entire NFST 853.1B (.7 mile). The other proposed egress road would be overlaid on a portion of Social 7 (.2 miles) which is proposed to be included as a system trail. Because of the proposed 30 foot width, this could negatively affect the non-motorized experience on these trails.

Anticipated population growth in the adjacent urban areas and the popularity of outdoor recreation would continue to place demands on the existing recreational opportunities throughout the county and across the Boulder Ranger District, including specifically within this project area. By proposing a sustainable trail system with adaptive management, this area would become more resilient to future recreation growth and needs for trails in the area. A beneficial cumulative effect would be achieved by providing a trail system that would connect to neighboring communities and regional trail connectivity opportunities with the Toll Conservation Easement Trail to the west of the project area and with Boulder County's Reynolds Ranch Open Space area in the eastern zone of the project area.

3.3 Soils, Water and Invasive Plants ---

Issues for Analysis:

Physical Sustainability of the Non-motorized Trail System

- The non-motorized trail system could adversely affect soils, hydrology, and the spread of noxious weeds because the trails may not be designed or maintained in a sustainable fashion.

Soils and Water:

Alternative A – No Action: Existing Condition

Existing Watershed Condition Classifications: The project area occurs within three 6th level watersheds on the Boulder Ranger District. The watershed hydrologic unit codes, names and watershed condition ratings are summarized in Table 6.

Table 6. Project Area Watersheds and Watershed Condition Ratings

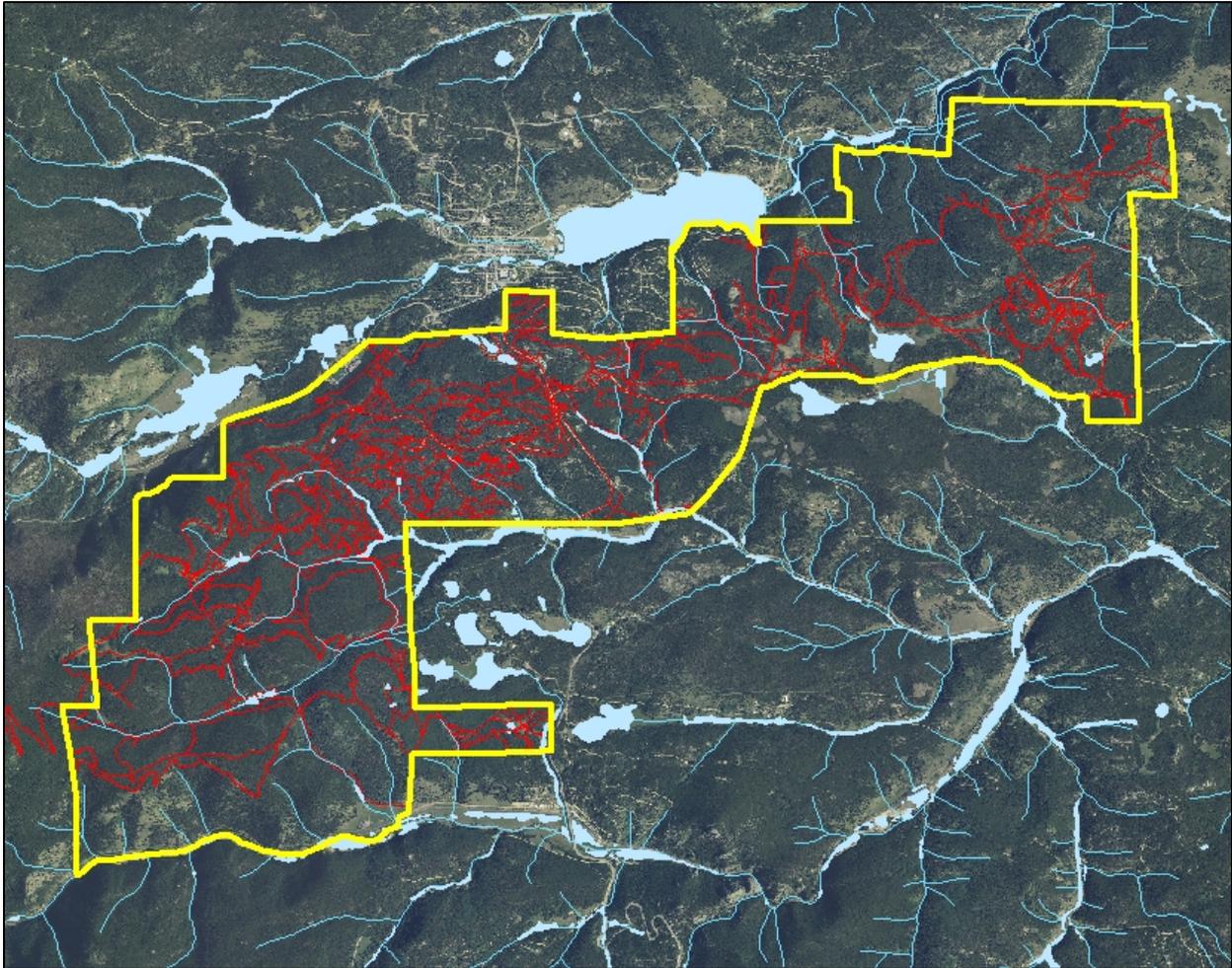
	Watershed Condition Rating
Middle Boulder Creek	Functioning Properly
Upper South Boulder Creek	Impaired Function
Middle South Boulder Creek	Functioning at Risk

Watershed condition ratings were determined according to criteria provided in the Watershed Condition Framework: http://www.fs.fed.us/sites/default/files/Watershed_Condition_Framework.pdf. The purpose of the framework is to provide a comprehensive and consistent approach for classifying and tracking changes to watershed condition. The watershed condition ratings are based on 12 indicators that are surrogate variables representing ecological, hydrological, and geomorphic functions and processes that affect watershed condition. Road/trail density, alignment and functioning condition were one of many factors considered in determining watershed condition ratings. General trends towards improvement or degradation of future watershed condition ratings can be determined through description of direct and cumulative effects on soil and water resources described below.

Drinking Water Source Watersheds: Middle Boulder Creek watershed is the primary drinking water source watershed for the town of Nederland. Both Middle and South Boulder Creek watersheds are part of larger collection systems that supply drinking water for Boulder, Denver and other Front Range cities.

Project Area Streams, Lakes, Ponds, Wetlands and Riparian Resources: Project area streams include steep tributaries to South Boulder Creek above Rollinsville, Beaver Creek, upper reaches of Forsythe Canyon Creek and, steep tributaries to Middle Boulder Creek (generally below Nederland). The Los Lagos Lateral Ditch is located within the project area. There are 6 small unnamed lakes, ponds and/or reservoirs within the project boundary. Lakes, ponds or reservoirs immediately outside the project boundary but connected via project area stream channels include Beaver Lake, Giggey Lake, Glen Reservoir, Opalair Reservoir and Los Lago Reservoirs 1 through 3. There are several known wetlands within the project area but extensive “on the ground” inventory of wetlands, meadows and riparian areas has not been completed. The following figure is included to depict the extensive existing road/trail (both system and social) network (red) along with the aquatic and riparian resources including lakes, ponds, streams and riparian vegetation (blue) within the project area. The numerous trail-stream intersections and trail alignments directly adjacent to streams or other water bodies are of primary concern due to increased potential for impacts on riparian vegetation, stream channels and water quality. With the exception of Beaver Creek and the reach of South Boulder Creek along the southern project boundary, most streams within the project area are intermittent or ephemeral.

Figure 1. General Road/Trail Density and Lakes, Ponds, Meadows and Riparian Areas

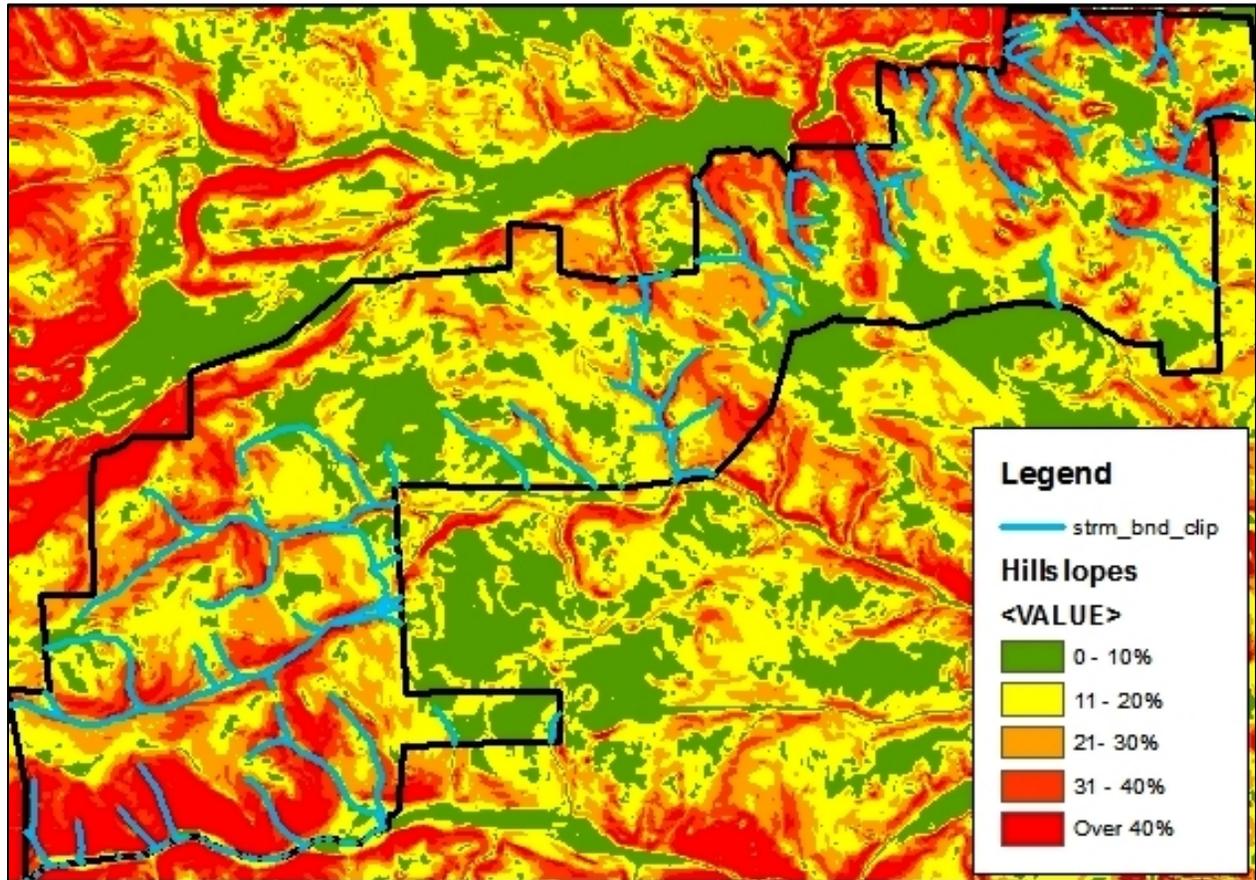


Project Area Hillslopes, Erosion and other Physical Processes: Figure 2 shows hill-slopes ranging from relatively flat to relatively steep within the project area. Most of the steep terrain occurs in the upper reaches of the Beaver Creek Drainage and in side drainages tributary to the south and middle forks of Boulder Creek. As indicated in the trail alignment and design guidelines (proposed action), steep terrain presents additional challenges from a trail alignment, construction and maintenance perspective. From a soil and water perspective, increased potential for trail erosion and sediment delivery to stream channels is often associated with steep terrain and/or trail proximity to stream channels. Erosion hazard ratings, determined from hill-slopes and various soil properties, were moderate over 69% of the project area. Where hillslopes exceeded 30%, erosion hazard ratings were generally severe. Overall, 25% of project area soils had severe erosion hazard rating. The remaining 6% of project area soils had slight erosion hazard ratings.

In the absence of natural or anthropic disturbance, natural rates of erosion are typically low on forested project area hill-slopes due to high litter, duff or vegetative ground cover. Soil erosion is accelerated by ground disturbing activities or features that remove protective ground cover or alter runoff rates. Currently, most of the soil erosion in the project area appears to be

occurring on roads and trails. Other infrequent and episodic natural erosion processes are landslides and debris flows. Hill-slopes in the area are not generally highly susceptible to mass wasting so landslides are not common. Debris flows and rock falls are far more common than landslides, particularly following wildfire.

Figure 2. Project Area Hillslopes



Geology, Soil Parent Materials and Physical Processes: Project area bedrock is metamorphosed material of igneous intrusive origin. Valley bottom areas are unconsolidated. The geologic map unit Xg (granitic rocks of the 1,700-m.y. age group) covers the eastern part of the project area the area, Xb (biotitic gneiss, schist, and migmatite) is the dominant map unit in the central part of the project area and on the western fringe. The two polygons of Xb sandwich a swath of Xfh (felsic and hornblendic gneisses). On upper hill-slopes and ridgelines, soils are formed in residual parent materials (bedrock). On lower hill-slopes and valley bottoms, soils are formed in colluvial or alluvial deposited parent materials. In the project area, rock weathering and soil formation is relatively slow and uplands soils are generally shallow, medium textured and have high rock content.

Climate Zones and Aspect: Most of the project area occurs in the Lower Montane and Montane climatic zones. Areas of sub-alpine occur as elevation increases towards the western part of the analysis area. Within the Lower Montane and Montane, north facing slopes are generally more densely forested while south facing slopes feature open forests with understory vegetation in the form of grasses and forbs. The project area receives approximately 20-25 inches of precipitation annually with most of this occurring as thundershowers over the

summer months and snow over the winter months. The project area receives approximately 95-130 inches of snow annually. Generally, precipitation and snowfall is slightly higher in the western part of the project area.

Within the project area, climatic zones, aspects and precipitation/snowmelt regimes are likely to inform trail management strategies for seasonal closures, trail drainage design and restoration. Decisions on when to lift the seasonal closures in late Spring/early summer would be based on when adequate snowmelt has occurred to ensure dry trail conditions for sustainable use. Trail drainage features would be designed to effectively handle runoff from both snowmelt and high severity summer thundershowers. Restoration plans would consider variables such as temperature and soil moisture needed to support recovery of restored areas.

Soil Map Units and Taxonomy: The project area is covered by 16 Ecological Land Units, most of which repeat multiple times to total 61 mapped soil polygons within the analysis area boundary. The most common upland soil order in the project area is Inceptisol. The central concept of the Inceptisol is minimal soil development with weak definition of soil horizons. Inceptisols are generally shallow and have high rock content and thin surface horizons. Generally, these soils are not highly susceptible to deep compaction but are sensitive to ground disturbing activities that impact protective ground cover and/or the surface layer of soil. The most common soil order within the valley bottom areas is the Mollisol. The central concept of Mollisols is a thick and dark colored surface layer. These soils are susceptible to compaction and rutting.

Detailed descriptions of project area soil properties, qualities, and limitations are available in the *Soil and Terrestrial Ecological Land Unit Survey-Draft* (USDA Forest Service, 2001) and through the Web Soil Survey (<http://soildatamart.nrcs.usda.gov>).

Soil Properties: The following project area soil properties were selected based on their relevance for determining soil management interpretations such as site suitability for roads and trails, limitations ratings for road and trail construction, sensitivity to erosion, displacement and/or compaction, and challenges for restoration and re-vegetation. These interpretations provide trail managers with information which could help them predict ease or difficulty of trail system construction, trail management and /or restoration activities relative to other locations and other soil types.

Soil Rock Content and Texture: The vast majority of project area soils have over 35% soil rock content. Advantages include increased trail physical sustainability due to lower potential for entrenchment through compaction or rutting. Larger rocks may be used for building trail features and/or surface armoring where needed. Limitations associated with high rock content include increased difficulty with trail construction and rapid formation of loose, rocky surfaces if erosion of soils (fines) occurs. Restoration is challenging on soils with high rock content due to lower soil volume and decreased soil water holding capacity.

Soil texture is the relative amount of sand, silt and clay. Generally, project area soils are loamy which is favorable for trail construction, soil drainage, and trail use and maintenance in comparison with sandy or clayey soils. Loamy textures are favorable for restoration and revegetation based on relatively high soil water holding capacity.

Soil Depth and Width of Surface Layers: Project areas soils range from shallow to deep. Most of the project area has shallow soils (less than 15 inches deep). Moderately deep soils (30 inches) are common in the eastern portion of the project area and deep soils (50 inches or greater) are generally limited to meadows and riparian areas in valley bottoms. Shallow soils present some challenges for full bench trail construction in steep terrain although the narrow width and undulating alignment of cross country mountain bike trails generally minimizes this concern. Thin surface layers are common throughout most of the project area. Shallow soils with thin surface layers are often challenging to restore and revegetate due to low soil volume and low organic matter content.

Existing Condition of Project Area Trails: The following descriptions of the existing condition of project area trails were developed primarily from information gathered by Boulder Ranger District personnel during field review of project area trails during the 2015 field season. Trail condition information from a field assessment conducted by ContourLogic, *Proposed West Magnolia Trail System Master Plan* (June 2014) was also utilized.

Rapid review of the trails was conducted by Boulder Ranger District personnel to determine the extent to which existing trail conditions/alignment/design reflected the desired conditions/alignment/design described for the proposed Magnolia Trail System. Assessing the physical sustainability of the existing trails and observing existing impacts to soil and water resources were the key objectives. Field observations, taken on a segment by segment basis, included trail gradient, hill-slope gradient entrenchment, rutting, erosion sedimentation, presence and/or effectiveness of trail drainage features. Generally, measurements, notes and photographs were taken where the need for corrective management actions such as maintenance, repair, realignment and/or restoration, was identified. The results of the field survey identified many trail segments with gradients that exceeded one half of the hill-slope gradient. This basic trail alignment guideline, known as the half rule, is utilized to align trails to maximize trail drainage and minimize erosion. Erosion of trail tread was common on trail segments that did not meet the half rule. Generally, only short segments of trail exceeded the maximum recommended gradient of 10%. Lack of effective trail drainage was common throughout the project area. In many places, braiding and widening was noted. Recommendations for trail management response actions ranging from maintenance, installation of drainage structures, repairs, re-alignments and restoration were made on a site specific basis.

ContourLogic conducted a survey of several sections of trail to attain ground based information to describe the physical sustainability of the trail network in 2013 (*Proposed West Magnolia Trail system Master Plan* (June 2014)). Field methods were adapted from the US Forest Service Trail Condition Assessment Survey Matrix for Class 3 Trails. Recorded data included trail grade and width, cross-slope, erosion depth, and canopy cover. Subjective trail condition ratings ranged from poor to good. Of nearly 6 miles of trail assessed, approximately 30% were in good condition, 26% were in fair condition, 23% were in poor condition and 21% had been altered due to logging operations. Trails in good condition can easily be maintained in place. Trails in fair condition require a combination of management response actions including maintenance, installation of drainage structures, repairs and/or minor re-alignments. Trails in poor condition exhibit extensive erosion and/or sedimentation, braiding and widening. These trails generally

require major repairs and/or re-alignment. Obliteration and restoration of abandoned alignments should be scheduled within the same general timeframe as construction of new trails.

Field observations and recommendations, described above, were neither extensive nor detailed enough to serve as the final prescription for each and every section of trail. However, information collected adequately describes the general existing condition of project area trails for this analysis. Additional field based review and design would occur as part of project implementation.

Alternative A – No Action: Environmental Effects

Direct and Indirect Effects

By maintaining the current condition (No Action) and not making changes to the trail/road system, there would be no reduction of the acres of disturbed ground within the project area. Under the No Action Alternative, the benefits associated with the Proposed Action (see Summary of Spatial Effects under Alternative B, next section) of restoration of approximately 18 acres of disturbed ground would not be realized.

Table 7. Existing Trail System

	Total miles	Acres
Existing Trails	16.0	9.7
Social Trails (user created trails)	45.7	27.7
Total miles	61.7	37.4

Effects associated with Existing System and Social Trails: As shown in Table7 (above), the total disturbance footprint of the existing trail system is approximately 37 acres, assuming an average trail/cut/fill width of 5 feet. Direct effects on soil resources associated with trail construction and use are removal of the forest floor, disturbance or displacement of the surface layers and soil compaction. Field observations indicate erosion of trail tread is common throughout the project area. In many places on the existing trail network, poor trail alignment, lack of effective drainage and/or lack of routine maintenance are largely responsible for existing erosion and increased potential for ongoing erosion.

Effects associated with Social Trails and Expansion of Social Trails within the Watershed:

Social trails make up approximately 74% of the existing trail system. This is probably a conservative estimate based on incomplete mapping and on-going expansion of the social trail network.

It is recognized that many of the social trails are currently lightly used. Regardless, ongoing expansion of the social trail network continually and incrementally generates impacts on soil and water resources. Additionally, proper alignment, effective drainage and ongoing maintenance of social trails are unlikely to occur. As outlined in the existing conditions section of this report, road/trail density, alignment and functioning condition are three of many factors

considered in determining watershed condition ratings. Existing social trails and future expansion of social trails within project area watershed generates a trend towards lower existing and future watershed hydrologic function and watershed condition ratings. In summary, social trails and expansion of social trails within the watershed has potential to seriously impact existing and future conditions for soil and water resources

Because unsustainable system trails would continue to deteriorate and have erosion problems, social trails would continue to proliferate and existing social trails not be obliterated.

The No Action Alternative would:

- not have improved physical sustainability of trails and reduced impacts on soil and water resources through modification of trail alignments and improved trail design;
- have increased probability that the density of the social trail network would continue to increase within the project area;
- not have the benefits of a responsive monitoring, maintenance, repair and restoration adaptive management program.

Cumulative Effects

Because future use of the trail system could increase with increasing population pressure, it can be expected that the continued resource damage and effects to the soil and water resources would continue to compound. Future vegetation treatments in the project area could exacerbate these effects, because the trail system as it currently exists in places is not built sustainably nor would it be able to adapt quickly to future impacts because there would not be an adaptive management component as included in the Proposed Action.

Alternative B - Proposed Action: Environmental Effects

Direct and Indirect Effects

Effects associated with Developing a Sustainable, Designated Forest Trail System within the Watershed: To prevent further resource damage, social trails not identified as part of the final trail system (see Map 7, Appendix A) would be excluded from the trail system and obliterated. All new social trails created after the decision of this analysis would be obliterated. Table 8 shows the actions proposed by this alternative.

Table 8. Proposed Trail System Actions

	Total miles	Acres
Existing System Trail – No Action	14.3	8.6
New Trail Construction	8.9	5.4
Social Trail – Convert to System Trail	16.8	10.2
Road Converted to System Trail	4.1	2.5
Decommission and Obliterate System Trail	1.8	1.1
Obliterate Social Trail	29.0	17.5
Total miles	74.8	45.3

Potential positive and negative impacts on soil and water resources are based on:

- Direct effects associated with the spatial footprint of trails on the ground such as removal of the forest floor, disturbance or displacement of the surface layers and soil compaction
- Factors affecting trail system physical sustainability such as trail alignment, effective drainage, potential for ongoing maintenance and proposed restoration

Actions Causing No Change to Disturbed Area/Trail Density: The length of approximately 14.3 miles of existing trail and 15.8 miles of existing road would remain unchanged and approximately 16.8 miles of social trail would be converted to system trail. These actions would not change trail miles or the associated disturbance footprint. Direct effects such as removal of the forest floor, disturbance or displacement of the surface layers and soil compaction would remain unchanged.

Actions Increasing Disturbed Area/Trail Density: The proposed new trail construction would result approximately 5.4 acres of additional direct effects such as removal of the forest floor, disturbance or displacement of the surface layers and soil compaction.

Actions Decreasing Disturbed Area/Road-Trail Density: Approximately 4.1 miles of road would be converted to trail. Assuming narrowing from 15 feet road width to 5 feet trail width and restoration of the unused area, approximately 2.5 acres of compacted (roaded) area would be restored. Approximately 29 miles of social trails, 1.8 miles of system trails and 1.3 miles of road would be obliterated, generating another 20.9 acres of restored ground. Total restored ground would be 23.4 acres.

Summary of Spatial Effects: Overall, implementation of the proposed actions would increase system trail miles, decrease social trail miles and decrease road miles. Soil and water resources would benefit from restoration of approximately 23.4 acres, but proposed new trail construction would create 5.4 acres of additional disturbance. Net reduction in disturbance would be approximately 18 acres. In other words, the condition of soil and water resources would improve by reduction of disturbed, compacted and/or eroded ground within the watershed.

Effects of Improving Trail System Physical Sustainability: Soil and water resources would generally benefit through improving trail alignments, improving drainage, implementing restoration actions where needed and providing a flexible adaptive management approach to identify and implement trail maintenance and/or other response actions if, when and where needed.

Effects of Trail Obliteration and Restoration: All proposed restoration activities would benefit soil and water resources. Abandoned trail sections and social trails would be obliterated/restored and revegetated to decrease the spatial footprint of impacts to soil and water resources within project area watersheds. Trail obliteration and restoration would be prioritized based on existing resource damage and potential for additional foreseeable future resource damage associated with trails or creation of additional social trails. Obliteration and restoration of abandoned or social trails would occur concurrently with new trail construction

to avoid a trend towards increasing trail density within project area watersheds. The Forest Service would collaborate with partners to monitor the condition of trails over time and implement restoration and/or other response actions if/when/where need.

Effects of Trail/Area Regulations and Signing: Positive effects on soil and water resources are likely to result from the application and enforcement of proposed regulations and area management strategies.

Effects of Prohibiting Snowmobile Use: Based on relatively low snowmobile use in the area, prohibiting winter motorized use (except by Forest Service authorization and special use permit) within the project area would not likely measurably change runoff timing at the watershed scale because of the relatively small percentage of watershed area that experiences snow compaction and delayed melt. However, at the site scale, repeated year-to-year snow compaction can affect vegetation. This effect may be negligible where snowmobile or other winter trails follow summer trails (that support no vegetation). Where winter trails are located over vegetation, repeated delayed snow melt effectively shortens the growing season, and changes in plant communities and increased bare ground can result. Closure to snowmobiling would limit snow compaction from snowmobile trails where it currently occurs. It would be expected that where snow compaction has affected plant communities, those communities would slowly recover.

Effects of Connector Trails: Connector trails to other trail systems is likely to increase use of those systems. That increase may increase the need for management and trail maintenance on the other trail systems. If the connector trail does increase use in the other systems increased trail maintenance and management would be required, a component of the adaptive management part of this alternative. Proactively correcting problems associated with these connector trails could reduce impacts to soil and water resources.

Effects of Adaptive Management: Monitoring, timely maintenance and/or implementation of other appropriate response actions is critical to ensure long-term physical sustainability of the trail system by avoiding, reducing or minimizing impacts on soils, riparian vegetation, wetlands and stream channels and water quality. Response actions include, but are not limited to, maintenance, repair, closure (short-term, seasonal or permanent) and restoration. Having adaptive management as a component of the Proposed Action would minimize impacts to the soil and water resource and would have beneficial effects compared to Alternative A- No Action.

Cumulative Effects

Alternative B proposes to build a sustainable trail system with adaptive management that would respond to resource issues as they develop in the future. The prediction for an overall net positive effect for soil and water resources is reinforced by the future/ongoing commitment to adaptive management actions such as maintenance of effective trail drainage, ongoing obliteration/restoration of social trails as they accumulate on the landscape and alignment of trails to minimize impacts on soil, water and riparian resources. A general trend towards improvement of future watershed condition ratings would be associated with implementation

of the proposed actions. Relevant best management practices (USDA Forest Service. 2012), watershed conservation practices (FSH 2509.25, Region 2 Supplement, August 15, 1992), project specific design criteria and adaptive management are incorporated into forest management activities to minimize impacts to soil and water resources and to meet *Forest Plan* objectives for protection of soil and water resources.

Past, present and reasonably foreseeable actions as described at the beginning of this chapter could potentially increase effects to the soil and water resource. However, with all of the design features and adaptive management included as part of the proposed action, cumulative effects are not expected to be any greater than the direct/indirect effects described for this alternative.

Invasive Plants:

Most noxious weeds invading the United States originated in Europe and Asia and were introduced beginning in the 1800s. These plants entered the U.S. by a variety of means, including ship ballast soil, contaminated animal feed and crop seed, and intentional introductions as ornamental or medicinal plants. Some nonnative ornamental plants introduced for gardening and landscaping escape and become invasive.

Noxious weeds and other nonnative invasive plants threaten biodiversity and ecosystem stability. They are aggressive and capable of out-competing native plants for moisture, nutrients and sunlight often leading to the establishment of undesirable vegetation monotypes. One reason for this is that nonnative plants seldom have natural controls, including predators such as insects, viruses or bacteria, etc., that feed upon them and help control their spread. Nonnative, invasive plants can alter soil properties and plant community composition, which can negatively affect native plant species diversity and forage for wildlife species, resulting in changes in animal communities that depend on the affected ecosystems. In extreme situations, negative effects on water quality can occur due to increased erosion and runoff.

Alternative A – No Action: Existing Condition

Invasive plant occurrences have not been systematically mapped in the project area. Where they have been mapped, mainly in developed areas along existing trails and roads in the area, they are fairly widespread and abundant. Occurrences are expected to be more limited in extent and abundance in less developed and more densely forested parts of the project area. Numerous invasive plant species have been mapped adjacent to the Peak-to-Peak Highway which splits the project area. Abundance and extent of invasive infestations range from a few plants to large patches to individuals scattered over a large area depending on species, location, site disturbance, and plant growth habit.

Noxious weeds listed by the State of Colorado known to occur in the project area include diffuse knapweed, spotted knapweed, dalmatian toadflax, yellow toadflax, Canada thistle, musk thistle, bull thistle, scentless chamomile, and oxeye daisy. Other invasive plant species may occur and be undocumented or have the potential to be introduced and establish in the area. Orange hawkweed, a Colorado A list species (designated for eradication) and a high priority species for the ARP and the BRD, occurs within one mile of the project boundary. Myrtle

spurge, also a Colorado A list species, has been known to occur on private land within the project boundary.

Canada thistle the most widespread noxious weed in the project area. Musk thistle also occurs in a number of locations within the project boundary, but is more sparsely distributed. The highest priority species in the project area are diffuse knapweed, spotted knapweed, dalmatian toadflax, yellow toadflax, scentless chamomile, and oxeye daisy. These species are located in relatively few areas, and weed treatments in and around the project area have focused on them, both because of their potential for spread and because of the feasibility of treating the relatively few infestations. Canada and musk thistle have been treated in some areas, where they are near higher priority species and in some locations where they have densely infested landings from previous fuels treatments.

Other documented invasive plant species include cheatgrass, common mullein, Sweet clover, and smooth brome. These species are not a priority for treatment, either because they are a ubiquitous Colorado List C species as with cheatgrass and common mullein – species where the goal is not to stop the spread of these weeds, but rather to provide additional educational, research and biological control resources to jurisdictions that choose to require management; or because they are not a Colorado designated noxious weed species, such as smooth brome.

Treatment of invasive plants on the ARP is based on the concept of integrated weed management (IWM) and is consistent with the *ARP Noxious Weed Management Plan* included in the *Decision Notice and Finding of No Significant Impact for Noxious Weed Management Plan on the ARP* (2003). The goal of IWM is not total eradication of noxious weeds, but successful long-term management through a combination of biological, chemical, cultural, and physical methods. In general, noxious weeds are prioritized for treatment based on aggressiveness, current extent of infestation, and priority of species by state and county weed programs.

Alternative A – No Action: Environmental Effects

Direct and Indirect Effects

Invasive plants establish and spread primarily along roads and trails and other disturbed areas, and from there can spread to adjacent more intact ecosystems. Recreation use, both motorized and non-motorized, can spread weeds by transporting seeds and other plant parts – including on clothing, shoes and boots, dogs, horses and their excrement, and mountain bike and motorized vehicle tires. Recreation use would continue and likely expand with additional social trails in the project area under Alternative A, continuing and potentially increasing the potential for weed introduction and spread by ongoing recreation use. Under Alternative A, mountain bike and equestrian use would not be restricted to system roads and trails, therefore the potential would remain for these uses to introduce weeds to off-trail areas.

Cumulative Effects

For cumulative effects on invasive plant infestations, the analysis area is the area within the

overall project area boundary.

Human activities in the project area all have the potential to introduce and spread weeds to varying degrees. Refer the beginning of this chapter for a list of actions considered for cumulative effects. Activities with greatest potential to increase invasive plants are generally those that include the most ground disturbance and open the forest canopy, such as fuels treatments across boundaries, especially clearcuts and patch cuts; construction such as the proposed Gross Reservoir expansion; some past mining activity; and other construction such as new or expanded parking areas, trailheads, driveways, and residences.

According to the Final Environmental Impact Statement for the ARP *Forest Plan* (USDA Forest Service 1997), it is reasonable to expect that, left unchecked, noxious weeds will increase at an annual rate of 10 to 15 percent. Weed management programs have been initiated or improved in the past few years on the ARP, including the Boulder Ranger District, and on adjacent lands. In general, invasive plant infestations can be expected to increase over time, unless all landowners and managers implement and maintain proactive, integrated weed management programs.

Alternative B - Proposed Action: Environmental Effects

Direct and Indirect Effects

In general, weeds can become established in areas disturbed by motorized and non-motorized recreation, road construction and maintenance, timber harvest, and other activities and by natural disturbances such as fire, and are spread by people, vehicles, wind, water, and wild and domestic animals. Roads and trails are frequently sources of noxious weed introduction, increasing both the potential for new infestations and the spread of weeds and weed seeds to new, uninfested areas. Weed seeds can be picked up, transported, and deposited by motorized and non-motorized vehicles, in mud sticking to the vehicle, in wheels, and in other parts of the undercarriage of the vehicle. Road and trail building, off-road vehicles, and construction also damage vegetation and disturb the soil surface, making it easier for noxious weeds to invade. The specific potential threats of new infestations or increased spread of existing infestations from the proposed project, are: from equipment used to create new and obliterate existing trails, workers transporting seeds on their shoes and clothing, and from the seed and mulching material used to restore areas.

With or without project activities, smaller infestations can be controlled or eradicated at some sites with annual treatment for a number of years. It is not always possible to completely eradicate larger infestations. It is important to avoid working in and spreading weedy species as much as possible during project implementation. Treatments over multiple years, followed by monitoring, are necessary for all noxious weed species since seeds in the ground would continue to sprout even after growing plants are removed.

Alternative B includes construction activities at two trailheads and for new trails and rerouting and obliteration of existing trails. These activities, have the potential to introduce invasive plants, resulting in a greater short-term potential for weed establishment and spread in

affected areas than under Alternative A. Remaining overall trail mileage would be less under Alternative B than under Alternative A, resulting in somewhat lower long-term potential for weed spread under Alternative B compared to Alternative A. Alternative B includes restricting mountain bike and equestrian use to system trails, which would reduce potential for weed spread in off-trail areas.

Listed in the Design Criteria for the Proposed Action in Chapter 2 are prevention measures designed to comply with the *Guide to Noxious Weed Prevention Practices* and the *Arapaho and Roosevelt National Forests and Pawnee National Grassland Noxious Weed Management Plan*. These design criteria should minimize the effect of invasive plants for Alternative B.

Cumulative Effects

The cumulative effects discussion under Alternative A also applies to Alternative B. In the short term, Alternative B is expected to add more than Alternative A to cumulative effects in areas of disturbance for trailhead expansion, new trail construction, and existing trail rerouting and obliteration. However, by applying the design criteria, implementing *the ARP Noxious Weed Management Plan* as well as lowering the remaining trail mileage and restricting mountain bike and equestrian use to system trails, in the long term, Alternative B is expected to add to cumulative effects at a level somewhat lower than Alternative A. Cumulatively, Alternative B will aid in reducing invasive plants when considering the other impacts the project area receives from motorized users, private landowners and past and future fuel treatment projects.

3.4 Wildlife

Issues for Analysis:

- Non-motorized and motorized users within the project area during all seasons could disturb wildlife and fragment wildlife habitat. In particular, trails and associated activities may impact effective habitat, as defined in the *Forest Plan* as well as spring and fall elk migration.

Alternative A – No Action: Existing Condition

Vegetation in the project area is a mix of montane, upper montane and subalpine plant communities consisting of Douglas-fir, limber pine, lodgepole pine and ponderosa pine, often occurring together in mixed conifer stands; aspen, dominant in some wetter areas and scattered among conifers across the project area; Engelmann spruce and subalpine fir; and meadows with grasses and shrubs. There is no existing old growth, old growth retention, or old growth development mapped within the project area. Streams occur throughout the project area with riparian vegetation associated with perennial and intermittent streams, and sometimes to varying degrees with ephemeral drainages. Elevation ranges from just below 8,400 feet at the eastern boundary of the project area to 9,600 feet at the western boundary.

The project area provides habitat for numerous terrestrial wildlife species including birds, mammals, and amphibians. Topography varies from flat to quite steep and the habitats described above are intermingled throughout the area. The project area and surrounding areas are heavily influenced by human development and use including roads (paved state highways, paved and gravel county roads, forest roads, neighborhood and town roads, driveways); residential development (towns, mountain subdivisions, individual residences, defensible space); year-round motorized use ranging from motorcycles to full-size vehicles; year-round non-motorized recreation use including hiking, mountain biking, horseback riding, running, dog-walking, overnight camping, and target shooting; fuels treatments across ownerships; and several US Forest Service and county trailheads.

The project area spans several geographic areas (GA) as identified in the *Forest Plan* and displayed in the table below. The majority of the project area is within the Lump Gulch GA, with a small amount in the Boulder Creeks GA. No existing or proposed trails occur in the project area section of the Thorodin geographic area. Maps and descriptions of these geographic areas can be found in Chapter 2 of the *Forest Plan*.

Table 9. Geographic Areas by Acreage

Geographic Area	Project Area Acres
Boulder Creeks	141
Lump Gulch	5852
Thorodin	9
Total	6002

Forest Plan Management Area designations for the project area are as follows:

Table 10. Management Areas by Acreage

Management Area	NFS Acres	Non-NFS Acres	Total Project Area Acres
3.5 Forested Flora and Fauna Habitats (East Zone)	1,492	245	1,737
3.5 Forest Flora and Fauna Habitats (West and South Zones)	1,349	128	1,477
Subtotal for MA 3.5	2,841	373	3,214
4.2 Scenic Areas	305	220	525
4.3 Dispersed Recreation	938	36	974
7.1 National Forest-Residential Intermix	266	1,023	1,289
Total Acres	4,350	1,652	6,002

As displayed in the above table, just over half of the project area is within Management Area 3.5, Forested Flora and Fauna Habitats, with a management emphasis of providing adequate amounts of quality forage, cover, escape terrain, solitude, breeding habitat, and protection for a wide variety of wildlife species and associated plant communities. (See Chapter 1, section 1.5 *Forest Plan* Direction for a description of the Management Areas)

Effective Habitat, Interior Forest, Forested Corridors, Key Winter Range, Road/Trail Density

The existing condition of the project area is not consistent with *Forest Plan* direction and guidance (see Chapter 1, Section 1.5 *Forest Plan* Direction, Effective Habitat). This is due to the existence and ongoing creation of roads and trails that was not reflected in the *Forest Plan* analysis in the mid-1990s.

The table below displays project area acres by *Forest Plan* Geographic Area, with effective habitat percentages by geographic area as of the 1997 *Forest Plan*.

Table 11. Effective Habitat Percentages by Geographic Area

Geographic (Geo) Area	Total Acres in Project Area	% Effective Habitat in Geo Area as of 1997 <i>Forest Plan</i>*
Lump Gulch	5,852	49
Boulder Creeks	141	52
Thorodin	9	59
Total Acres	6,002	

* *Forest Plan* EIS, Appendix B, Table B.2, pp 15-16

Currently, effective habitat in all three Geographic Areas, listed above, is estimated to be lower than these percentages due to the existence and ongoing creation of roads and trails not reflected in the *Forest Plan* data from which the percentages were generated. Additionally, the above percentages do not take into account fuels treatments implemented since the *Forest Plan*. Fuels treatments, particularly patch cuts and clear cuts, can reduce effective habitat when they are located near roads or trails.

Quantitative data and updated effective habitat mapping, interior forests and forested and open corridors are not available for the existing situation on the ground (existing condition). Therefore, this analysis is a qualitative assessment based on the existing *Forest Plan* effective habitat mapping and the changes expected if the Proposed Action were to be implemented.

Two patches of interior forest are qualitatively mapped in the project area – one northwest of the Front Range trailhead (East Magnolia zone) and the other directly west of Manchester Lake and north of Rollinsville (South Magnolia zone). The interior forest northwest of the Front Range trailhead has likely been reduced along the edges by Social 10 which nearly borders it to the south, and Social 12 which borders it to the east. This interior forest has likely also been reduced by other social trails northwest of the Front Range trailhead. The interior forest area west of Manchester Lake is bisected by Social 16. This trail and a network of other social trails is estimated to have reduced the current interior forest patch in this area, although quantitative data and updated mapping are not available.

Mapped forested corridors on NFS lands are most prevalent in the West and South Magnolia zones west of Highway 119 and in the East Magnolia zone near the Front Range trailhead, where there are larger blocks of NFS lands. Mapped forested corridors are more limited between Barker Reservoir and the Front Range trailhead (East Magnolia zone). Current forested corridor mapping does not include updates for vegetation treatments on NFS lands in West Magnolia and some areas further east along Magnolia Drive, and does not include vegetation

treatments on County, private, and other lands. Openings created by vegetation treatments have reduced forested corridors locally in these areas, until trees regrow sufficiently to provide forested corridors again.

South Magnolia zone and a portion of the West Magnolia zone, which encompass roughly the western half of the project area, is seasonally closed to motorized use during winter and spring, for a combination of wildlife (primarily elk) habitat protection and protection of roadbeds during wet periods. There are currently no seasonal closures to non-motorized use in the project area based on key elk or deer winter range, and no such need has been identified by CPW or Forest Service biologists to date.

Forest Plan guideline 107 (p. 31) discusses favoring seasonal use during non-critical times for wildlife. Non-critical times for wildlife vary by species and area. In general, critical times include reproduction – for example bird nesting, elk calving, and deer fawning. No calving or fawning areas have been mapped by CPW in the project area. Critical times for elk in the project area are primarily migration and winter, because both an elk migration corridor and key winter range encompass most of the project area. Mule deer migration occurs throughout the project area. Migration occurs in spring, generally April through June, and fall, from late August to as late as December in some years to the lowest elevations of winter range. Migration timing varies by year and depends on snowfall and other factors (CPW 2005, Hallock 1991).

Travel route densities, including roads and trails, of 2.0 miles per square mile or less are generally recommended as acceptable for certain wildlife habitats, especially for elk, while densities approaching 3.0 or more are generally not recommended (USDA Forest Service (USFS) 1997, *Forest Plan FEIS* p. 229). More recent literature related to travel route density impacts on wildlife focuses primarily on roads. Not much research has analyzed trail density, therefore, recommended densities may not be accurate when combining roads and trails. Project area-wide including all ownerships, current (Alternative A) average travel route density (for roads, system trails and social trails) is approximately 11.0 miles per square mile, over five times the recommended density for wildlife of 2.0 miles or less, with the caveat that the research has mainly looked at roads.

Alternative A – No Action and Alternative B – Proposed Action: Environmental Effects

Direct and Indirect Effects to Both Alternatives

Human activities related to roads and trails have varying effects on wildlife species depending on many factors including human use levels, activity type(s), habitats involved, time of day or season, and the species affected. Basically all activities related to roads and trails affect wildlife species. The widespread, detrimental impacts of human disturbance on wildlife are well documented in the literature. No positive benefits to wildlife have been identified from increases in travel management access. Direct and indirect effects on wildlife that have been identified in the literature indicate negative impacts on all studied species as motorized,

mechanized, foot, and horse uses increase (Knight and Gutzwiller 1995, Joslin and Youmans 1999; Wisdom et al. 2004; Rowland et al. 2005; Francis et al. 2009; USFS and BLM 2010).

Roads and trails fragment wildlife habitat to varying degrees, depending on width, surface material, location, density (see density discussion below), individual wildlife species needs, and other factors (Rowland et al 2005, USFS and BLM 2010). For example, the existence of a single narrow trail may pose a movement barrier for small animals such as shrews and amphibians but not for larger mammal species or birds. Habitat fragmentation associated with trails includes effects from recreational use of trails, such as negative impacts on breeding birds from human-adapted species, including increased cowbird nest parasitism and increased predation by species such as skunks, raccoons and foxes using trails as corridors. These effects can occur even if the forest canopy is not opened by the trails (Jordan 2000).

Roads and trails can result in disturbance and increased mortality from construction activities, direct mortality from collisions with vehicles, short- or long-term modification of animal behavior, alteration of the physical and chemical environment, spread of nonnative invasive species, and increased use of habitats by humans (Trombulak and Frissell 2000). Roads and trails along streams can negatively affect riparian vegetation with concurrent increases in sedimentation to adjacent streams. Sediment can inhibit or kill periphyton communities, bacteria, and fungi, which are important food sources for invertebrates, amphibians, and fish (Knight and Gutzwiller 1995). Noxious weeds are capable of affecting wildlife habitat at the landscape scale (Joslin and Youmans 1999).

Much of the literature, especially the literature regarding elk, suggests that motorized activities may have a greater impact than non-motorized activities. The literature shows that elk are displaced a greater distance away from motorized routes than non-motorized routes. However, foot, horse, mountain bike, and other non-motorized activities related to roads and trails may have as great an impact as motorized use if level of use is high, unrestrained dogs accompany the user, or use is at times of day or season of the year especially critical to the affected wildlife species (USFS and BLM 2010). A study of Rocky Mountain elk movement demonstrated a strong avoidance of elk to all-terrain vehicles detected up to one km from the disturbance; elk avoidance of mountain bikers was detected up to 500 m, and avoidance of hikers and horseback riders was detected to 200 m (Preisler et al 2013).

Alternative A – No Action: Environmental Effects

Direct and Indirect Effects

Effective Habitat, Interior Forest, Forested Corridors, Key Winter Range, Road/Trail Density

As stated under the existing condition, this alternative is not consistent with *Forest Plan* direction and guidance (see Chapter 1, Section 1.5 *Forest Plan* Direction, Effective Habitat). This is due to the existence and ongoing creation of roads and trails not reflected in the *Forest Plan* analysis in the mid-1990s, the existing condition of effective habitat for the project area. Because Alternative A does not propose to do any action, social trails would remain and likely

continue to proliferate. This is the existing condition and a *Forest Plan* amendment is not needed when no action is proposed.

Under Alternative A, ongoing encroachment into both of the interior forest patches would be expected to continue and potentially expand if additional social trails are created in these two areas.

This alternative is not expected to reduce forested corridors beyond what has currently occurred, because the trails are narrow gaps within the corridor.

This alternative, by its definition as no action, does not have an adaptive management component. Therefore, it would be more difficult for Forest Service managers to respond quickly to changing conditions. If a closure is needed to protect elk migration, elk winter range in the future or nesting areas it would take additional analysis to have that closure put in place.

Alternative A average travel route density is approximately 11.0 miles per square mile, over five times the recommended density for wildlife of 2.0 miles or less. Nothing would be done to reduce this, so it would remain the same or get worse.

Cumulative Effects

Effective habitat would be expected to be further reduced in the future, with continuing creation and use of social trails.

Available effective habitat mapping does not include lands owned or managed by private landowners, Boulder County, the Town of Nederland, and other entities. Cumulatively, effective habitat across the project area has decreased since the *Forest Plan*, when considering project area trails, residential development including defensible space, fuels treatments and recreation use across ownerships, and the many unmapped trails created by mountain residents on NFS lands adjacent to their homes, used for hiking, dog walking, wildlife viewing and other activities.

Alternative B - Proposed Action: Environmental Effects

Direct and Indirect Effects

Potential benefits to wildlife from trail planning include concentrating human activity where it would be more predictable to local wildlife, providing opportunities for recreationists that would reduce motivation to create social trails, monitoring and prompt obliteration of new social trails, and avoiding/minimizing impacts to sensitive areas (Trails and Wildlife Task Force et al 1998).

Alternative B proposes to restrict use by mountain bikers and equestrians to designated trails as implementation occurs. This would help to limit impacts to wildlife by concentrating these uses to system trails, and limit future habitat impacts caused by cross-country travel and

continued creation of social trails that can result. This reduces wildlife impacts of Alternative B compared to Alternative A, which does not include off-trail travel restrictions.

Alternative B proposes to eliminate winter motorized use, other than specifically permitted uses. Winter snowmobile use within the project area is currently minimal and elimination of this use would reduce winter impacts to wildlife, particularly elk, though not by a great amount since this use is currently low.

Effective Habitat, Interior Forest, Forested Corridors, Key Winter Range, Road/Trail Density

This alternative is consistent with *Forest Plan* direction and guidance (see this EA, pp 6-7, Chapter 1, Section 1.5 *Forest Plan* Direction, Effective Habitat). Standard 2 under *Forest Plan*, Management Area 3.5 states. "Maintain or increase habitat effectiveness, except where new access is required by law. The existing condition (Alternative A) is currently below effective habitat *Forest Plan* Guideline 109. Alternative B includes obliteration of about 29 miles of social trails, including any created after the decision resulting from this analysis. With these actions, effective habitat is expected to increase from the existing situation on the ground in some portions of the project area as social trails are closed and obliterated. Alternative B does formalize some social trails (~17 miles) and add new trails (~9 miles), which would not improve habitat effectiveness. But, evaluating the 62 total miles of Alternative A's existing trails (system and social) versus the fully implemented Alternative B's final trail system of 44 miles shows a decrease of nearly 20 miles of trails throughout the project area. This decrease in total trail system mileage along with new regulations such as eliminating cross-country travel by mountain bikers and equestrians and eliminating winter motorized use should overall help to improve effective habitat from Alternative A. Alternative B is increasing effective habitat over the existing condition in agreement with Standard 2 direction.

Under Alternative B, adoption of some social trails would allow some existing encroachment into the two interior forest areas to continue; however proposed closure of some existing and all future social trails in the two areas is likely to reduce the ongoing encroachment and incrementally improve interior forest direction compared to Alternative A.

As with Alternative A, this alternative is not expected to reduce forested corridors beyond what has currently occurred, because the trail are narrow gaps within the corridor.

This alternative includes adapting management to changing conditions. Adaptive management provides for seasonal trail closures or other measures if warranted by resource conditions such as severe winters or elk calving if discovered in the future. Therefore, Alternative B would better meet the intent of *Forest Plan* direction for winter range and other critical wildlife periods than Alternative A. With Alternative B adaptive management, seasonal closures could be implemented specifically for various wildlife critical times such as raptor nesting if needed. Adaptive management provides for trail closures, trail rerouting or other measures if determined necessary for resource concerns, such as elk migration.

Given the highly fragmented landscape across the project area, maintaining some areas relatively undisturbed by humans is essential for wildlife. The project area serves important

migration and winter habitat functions for the Clear Creek elk herd, which are discussed under the Management Indicator Species analysis for elk in Section 3.5, below. Migration occurs in spring, generally April through June, and fall, from late August to as late as December in some years to the lowest elevations of winter range. Migration timing varies by year and depends on snowfall and other factors (CPW 2005, Hallock 1991). Providing travel corridors for elk would provide for movement of other larger mammals including mountain lions, mule deer, moose, bobcats, and black bears.

Some portions of the project area are currently less fragmented and therefore have greater potential to continue providing for wildlife habitat needs for a variety of species if trails are minimized, consolidated, eliminated, and/or rerouted. In particular, the location for New 1, which is in a less fragmented area providing forest cover for elk and other species and is an important part of an elk movement corridor between breeding and winter ranges, should be monitored prior to layout and design to determine elk movement. A portion of Social 14 should be moved to the north to avoid the south-facing slope used by elk and deer for foraging. Social 2 is located in a pinch point for elk migration between a production area on private land to the north and winter range to the east. Elk are forced by topography and human development to move through this small area in spring and fall. It is recognized that Social 2 is already receiving considerable use, therefore other management options might be appropriate such as seasonal closures. Other proposed trails (refer to the Wildlife Specialist Report) may warrant wildlife biologist involvement in layout and design, collaboration with external partners, and/or monitoring that may trigger adaptive management actions such as seasonal closures.

Overall remaining road and trail mileage would be lower under Alternative B than under Alternative A. However, habitat in these areas would remain fragmented and travel route density would remain well above levels recommended for wildlife. Under Alternative B, average project-area wide travel route density would be reduced to about 8.0 miles per square mile, or four times the recommended density for wildlife. Travel route mileage and density would decrease from Alternative A (about 11 miles) to Alternative B (about 8 miles) within the project area.

Adaptive Management:

Adaptive management under Alternative B would provide for seasonal closures, trail reroutes, and other measures where needed to protect wildlife. This would be beneficial to wildlife as responsive management actions could occur with minimal new environmental review. Alternative B adaptive management is discussed in more detail under Effective Habitat, above, and under individual species analyses for PTES species and MIS in following sections. For additional details, refer to the Wildlife Report.

Cumulative Effects

Cumulatively, the high level of travel route density and its associated recreational use and habitat fragmentation adds to other human activities that fragment wildlife habitat – including residential development, nearby paved highways, and fuels treatments across ownership

boundaries. Additional actions contributing to cumulative effects are listed at the beginning of Chapter 3 and discussed as part of the TES and MIS analyses. Also, the social trail mileages and densities do not include the many trails created by mountain residents on NFS lands adjacent to their homes, used for hiking, dog walking, wildlife viewing and other activities. The result of all of these human activities is a highly fragmented landscape across the project area. Alternative B would result in lower trail and road mileage remaining in the project area after implementation than Alternative A and, therefore, would add somewhat less to cumulative effects for wildlife.

3.5 Proposed, Threatened, or Endangered Species (PTES), Sensitive Species and Management Indicator Species (MIS) of Wildlife, Fish and Aquatic Insects, and Plants_____

Issues for Analysis:

- The Endangered Species Act of 1973 requires analysis of the effects to Proposed, Threatened or Endangered wildlife, fish and plant species that could be affected by the project proposal.
- Forest Service regulations require analysis of Regionally Sensitive wildlife, fish and plant species as well as Management Indicator Species (MIS) that could be affected by the project proposal.

Section 7 of the Endangered Species Act of 1973 (ESA), as amended, requires federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of Proposed, Threatened, or Endangered species, or result in the destruction or adverse modification of their critical habitats. In addition, the Forest Service has established direction in Forest Service Manual 2670 to guide habitat management for Proposed, Threatened, Endangered, and Sensitive species (PTES). This process ensures that PTES species receive full consideration in the decision-making process. The direction establishes the process, objectives, and standards for conducting a Biological Evaluation. A Region 2 Manual Supplement 2600-2015-1 provides additional direction for conducting the analysis required in Biological Evaluations.

The National Forest Management Act (NFMA), 36 CFR 219.19 and Forest Service Handbook (FSM 2621) direct the Forest Service to preserve and enhance plant and animal diversity, consistent with the overall multiple use objectives, to maintain viability of all native and desirable non-native species on the Planning Area (i.e. National Forest or Grassland). The Planning Area for this analysis is the Arapaho and Roosevelt National Forests (ARNF). Viable populations are defined as those with the estimated numbers and distribution of reproductive individuals to ensure that their continued existence is well-distributed (USDA Forest Service 1997).

Tables 12, 14, 15 and 16 list wildlife, fish and aquatic insects, and plant species considered for analysis for this project and Tables 13 and 14 show the findings for the analyzed species.

Wildlife PTES and MIS:

Alternative A – No Action: Existing Condition

Species Considered and Evaluated

The Arapaho and Roosevelt National Forests and Pawnee National Grassland obtained a project-specific threatened and endangered species list dated December 7, 2015 from the U.S. Fish and Wildlife Service (USFWS) using their on-line tool (www.fws.gov/ipac). This tool is recognized by the USFWS as an appropriate means of identifying threatened and endangered species for project areas. A copy of the documentation can be found in the project file.

The ARP received the Region 2 Forest Service sensitive species list effective August 29, 2015 from the Regional Forester. The list of Sensitive species found or suspected within the ARP was updated based on the Rocky Mountain Region Endangered, Threatened, Proposed, and Sensitive Species matrix dated October 13, 2015 and local data.

The complete list of MIS of the Arapaho and Roosevelt National Forests (ARNF) and Pawnee National Grassland (PNG) are listed in the *Forest Plan*. This list was amended by Forest Supervisor decision (USFS 2005).

Complete lists of PTES species and MIS considered for analysis by Region and Forests/Grassland can be found in the District files. Species listed in Table 12 were identified as either occurring within the Project Area, or having habitat that occurs within the Project Area.

Table 12. Wildlife Species Included in the Project Analysis

Threatened and Endangered Species	Management Indicator Species	Sensitive Species		
		Birds	Mammals	Amphibians
Canada lynx	elk mule deer Golden-crowned kinglet hairy woodpecker mountain bluebird pygmy nuthatch warbling vireo Wilson’s warbler boreal toad	American peregrine falcon bald eagle boreal owl, flamulated owl northern goshawk olive-sided flycatcher	American marten fringed myotis hoary bat North American wolverine pygmy shrew river otter Townsend’s big-eared bat	boreal toad northern leopard frog

Canada lynx, elk and mule deer are the wildlife species we will discuss in most detail in this EA, because of their habitats and movement within and through the project area. A complete description of the biology and analysis of effects for each species analyzed for this project is included in the Wildlife report in the project record. The determinations and findings for each species by each alternative are found at Table 13.

Canada Lynx – Listed Threatened under ESA

No critical habitat has been designated for any NFS lands covered under the Southern Rockies Lynx Amendment (SRLA), which includes the ARP.

The southwestern portion of the project area is located within the Boulder Lynx Analysis Unit (LAU), and the remainder of the area is not within any LAU. The Boulder LAU is about 77,120 acres in size, including non-NFS land. Most of this LAU is outside of the project area. Mapped lynx habitat acres totaling 44,070 acres. The remaining 33,050 acres consist of 8,211 acres of mapped non-habitat on NFS lands and 24,839 acres of non-NFS lands for which no data are available. The LAU is bounded to the north, south, and west by adjacent LAUs and to the east by a mix of NFS lands and other ownerships. The western portion of the project area overlaps the eastern edge of the LAU, at about the center from north to south (see Map 8 in Appendix A).

The Boulder LAU includes sizeable portions of the Indian Peaks and James Peak Wilderness areas, both of which contain trail systems heavily used for hiking, camping, and equestrian use. Both Wilderness areas contain forested areas, primarily subalpine spruce-fir, that provide lynx habitat and areas of alpine tundra that is not suitable lynx habitat. The LAU contains large parcels providing lynx habitat that are owned by the City of Boulder, Boulder County Parks and Open Space, and private individuals. Most of the NFS land outside the two Wilderness areas is mapped as lynx habitat, and is fragmented to varying degrees by roads, trails, mountain subdivisions, and other human uses.

There are no known breeding lynx in the Boulder LAU. Reintroduced lynx have passed through the Boulder LAU and adjacent LAUs (CPW 2010b). A lynx was documented in 2012 less than ten miles south of the project area, just outside of the Boulder LAU. It is not known whether any lynx have established home ranges in the Boulder LAU or whether any are currently present in the project area. For this analysis, it is assumed that individual lynx may occasionally occur in the Boulder LAU, including mapped lynx habitat in and adjacent to the project area.

Motorized use on NFS lands within the project area is currently permitted on the NFS roads identified on the Motor Vehicle Use Map. NFS trails are currently designated for non-motorized use under the previous direction of the Caribou-West magnolia EA, 2003. Within the project area, specifically the southwestern portion, where lynx habitat is located, illegal motorized recreational use occurs on the existing system and social trails despite education and enforcement efforts.

Winter snowmobile use within the project area is currently minimal. The primary snowmobile

use is by special use permit for landowners to gain access to property within the project area in the winter when roads are closed and unmaintained for winter travel.

Elk- Management Indicator Species

The project area is used by the Clear Creek elk herd. Key winter range for elk (severe winter range and winter concentration areas as defined and mapped by Colorado Parks and Wildlife (CPW) occurs throughout most of the project area, and all of the project area is within overall winter range. Most of the project area is within overall summer range. A migration corridor occurs throughout most of the project area. No elk calving is mapped in the project area. Elk pellets and other sign were found throughout the Forsythe project area, which overlaps the eastern portion of the project area, during 2010 and 2011 surveys.

Based on the most recent available CPW mapping, there are no elk calving areas in the project area; therefore, that portion of Guideline 106 does not apply (see Section 1.5 *Forest Plan Direction*). The *Forest Plan* defines key winter range for deer and elk as winter concentration areas and severe winter range as defined and mapped by CPW (USFS 1997). Key winter range for elk occurs throughout most of the project area.

South Magnolia zone and a portion of the West Magnolia zone, which encompass roughly the western half of the project area, is seasonally closed to motorized use during winter and spring, for a combination of wildlife (primarily elk) habitat protection and protection of roadbeds during wet periods. Currently, there are no seasonal closures to non-motorized use in the project area based on key elk or deer winter range, and no such need has been identified by CPW or Forest Service biologists to date.

Mule Deer- Management Indicator Species

According to CPW 2013 GIS data, the entire project area is within mapped mule deer summer range, and all except the far western portion is within overall winter range. A mapped migration pattern occurs through the project area from the southwest to the northeast (and vice versa). A mule deer winter concentration area overlaps the far eastern portion of the project area, and no mule deer severe winter range or overall concentration areas occur within the project area.

Within and surrounding the project area, fuels treatments on NFS and County lands in recent years have created relatively large openings north and south of Magnolia Drive east of Highway 119 and in East Magnolia, resulting in an increase in the grass-forb stage of lodgepole pine forests in the project area. Mule deer have been observed foraging in these openings. Scattered individuals and small groups of mule deer were encountered during 2010 and 2011 surveys throughout the Forsythe Fuels project area, which overlaps the eastern portion of the project area.

Sensitive Species and Other Management Indicator Species

Table 12 lists the species analyzed for this project. A complete description of the biology and analysis of effects for Sensitive and MIS species analyzed for this project is included in the Wildlife report in the project record.

Alternative A – No Action: Environmental Effects

Direct and Indirect Effects

Refer to the Summary of Determinations and Effects to PTES and MIS Species below and Table 13 for further discussion of direct and indirect effects to all wildlife species analyzed.

Canada Lynx – Listed Threatened under ESA

Alternative A is consistent with applicable Southern Rockies Lynx Amendment (SRLA) direction, except for potential for inconsistency with Objective HU O2: *Maintain recreational activities to maintain lynx habitat and connectivity*, in the long term due to continuing social trail proliferation.

Refer to pages 59-60, “***Direct and Indirect Effects to Both Alternatives***” under Section 3.4 for a general discussion of project impacts to wildlife. Under Alternative A, no new management actions would take place and current management of the project area would continue as is. No existing social trails or new trails would be changed to system trails, and social trails would not be obliterated. Some trail improvements or realignments for existing system trails could occur as general maintenance project work. Social trails would be expected to continue to proliferate, along with resource damage from their improper alignment, including in lynx habitat. Snowmobile use would be allowed and would be anticipated to continue at current minimal levels for reasons discussed above under Existing Conditions. Current permitted snowmobile use would continue. Non-motorized winter use would be expected to continue, with no grooming or parking expansion. Primary access points for the West Magnolia area are along West Magnolia and at limited informal parking pull-offs along Highway 119. Winter recreation use is expected to increase based on human population increases (see Recreation Specialist Report), however access and parking would remain limited and snowpack is inconsistent. Project area lynx habitat is somewhat remote from access points and not likely to receive high winter motorized or non-motorized use. Winter use in lynx habitat is not expected to reach levels that would consistently compact snow. No adaptive management is included under Alternative A; however if snow compaction were to increase sometime in the future, seasonal closures or other measures would require additional analysis, delaying the closure implementation.

Snow compaction and various lynx habitat are components of the Southern Rockies Lynx Amendment (SRLA). Refer to the SRLA consistency analysis in the Wildlife Specialist Report for further discussion of effects related to SRLA guidance.

Determinations of Effects and Rationale

Potential disturbance to individual lynx, if lynx travel through the project area and if they are briefly disturbed by trail use, is expected to be minimal, and therefore considered insignificant and discountable. Continued proliferation of social trails is expected to affect small, linear areas of lynx habitat to an extent considered insignificant and discountable. Additional consistent snow compaction in lynx habitat is not expected. Based on these factors, the above analysis, and the analysis documented in the Wildlife Specialist Report it is determined that the finding for Alternative A is ***may affect, is not likely to adversely affect*** the Canada lynx.

Elk - Management Indicator Species

Refer to Section 3.4-Wildlife and especially to “*Direct and Indirect Effects to Both Alternatives*”, for a discussion of recreation impacts to wildlife applicable to multiple species and habitats, as well as a detailed discussion of effective habitat, which is important for elk. Trails have an area of influence that differs by habitat and species. Alternative A would result in minor changes to physical habitat for elk including forest cover as new user-created trails appear, as the typical narrow non-motorized trails in the project area travel through forest cover, typically with little tree removal.

Although narrow trails typically do not change forest cover, large patch cuts in dense forest adjacent to open meadows, aspen or other grassy areas may compromise the suitability of some areas as winter habitat where portions of openings are too far from forest cover. Some existing project area trails are within areas of clearcuts and patch cuts from past fuels treatments, and other existing trails are within potential future fuels treatment units proposed under the Forsythe II fuels treatment project. This combination of high human use and openings can also reduce elk use of available forage.

Existing system and social trails and roads are likely impacting elk movement and use of forage. CPW personnel and local residents have observed changes in of elk occurrence and movement in different areas, however there are no recent studies attempting to document or quantify such changes. Ongoing proliferation of user-created trails is likely to continue under this alternative with current management, resulting in additional impacts. Based on CPW population estimates for the Clear Creek elk herd, the Clear Creek herd remains within population objectives. Elk are generally adaptable and CPW is not currently concerned about impacts to population numbers (Larry Rogstad, CPW, pers. comm. February 1, 2016). Potential impacts and CPW concerns, based on human development, mixed land ownership, and juxtaposition of different habitats, include spatial changes to elk migration, with increasingly limited movement options; temporal changes to elk movement, such as more movement at night, further restricting their options and possibly increasing risk of vehicle collisions when they cross highways; increased negative interactions with local landowners; increased exposure to disease; and decreased habitat quality from overuse of forage in more limited areas (CPW 2016). Additionally, the more that elk movements and forage use are restricted, the greater the risk of impacts to habitat for other species, if elk are forced to use a smaller overall area for foraging and overuse occurs.

As discussed above, while Alternative A may impact elk movement and forage use which can result in various impacts to elk and other species, elk population impacts are not expected in the foreseeable future. Therefore, under Alternative A, **the estimation of influence is no change to elk populations is expected locally or on the Planning Area**. The Planning Area for elk is the entire Arapaho and Roosevelt National Forests.

Mule Deer- Management Indicator Species

Refer to Section 3.4-Wildlife and especially to “*Direct and Indirect Effects to Both Alternatives*”, for a discussion of recreation impacts to wildlife applicable to multiple species and habitats, as well as a detailed discussion of effective habitat, which is important for mule deer. Trails have an area of influence that differs by habitat and species. Alternative A would result in minor changes to physical habitat for mule deer including forest cover as new user-created trails appear, as the typical narrow non-motorized trails in the project area travel through forest cover, typically with little tree removal.

In one study of trails with mountain biking and hiking, mule deer showed a 96% probability of flushing from on-trail recreationists within 100 meters from the trail, and the probability of flushing dropped to 70% by 390 meters from the trail (Taylor and Knight 2003). Large patch cuts in dense forest adjacent to open meadows, aspen or other grassy areas may compromise the suitability of some areas as winter habitat where portions of openings with suitable deer forage are too far from forest cover. Some existing project area trails are within areas of clearcuts and patch cuts from past fuels treatments, and other existing trails are within potential future fuels treatment units proposed under the Forsythe II fuels treatment project. This combination of high human use and openings can also reduce mule deer use of available forage.

As with elk, existing system and social trails and roads are currently likely impacting mule deer movement and use of forage in the project area. Ongoing proliferation of user-created trails is likely to continue under this alternative with current management, resulting in additional impacts. Based on CPW population estimates for the Boulder Creek mule deer herd, the herd remains within population objectives and in 2014 and some other recent years has been above objectives. Potential impacts and CPW concerns discussed under elk, above, likely apply to mule deer to some extent - spatial and/or temporal changes to movement, increased negative interactions with local landowners, and increased exposure to disease. Alternative A impacts are not expected to reach a level that would impact mule deer population levels in the foreseeable future.

As discussed above, while Alternative A may influence mule deer movement and forage use, mule deer population impacts are not anticipated in the foreseeable future. Therefore, under Alternative A, **the estimation of influence is no change to mule deer populations is expected locally or on the Planning Area**. The Planning Area for deer is the entire Arapaho and Roosevelt National Forests.

Forest Service Sensitive Species Analyzed

After analysis American marten, fringed myotis, hoary bat, North American wolverine, river otter, Townsend’s big-eared bat, American peregrine falcon, bald eagle, boreal owl,

flamulated owl and olive-sided flycatcher all had findings of **no impact** with no effects expected.

For pygmy shrew, northern goshawk, boreal toad and northern leopard from the analysis indicated a finding of **may adversely impact individuals, but not likely to result in a loss of viability on the Planning area, nor cause a trend toward federal listing.**

Other Management Indicator Species Analyzed

Under Alternative A, the **estimation of influence** is **no change** to all MIS populations, expected locally or on the Planning Area.

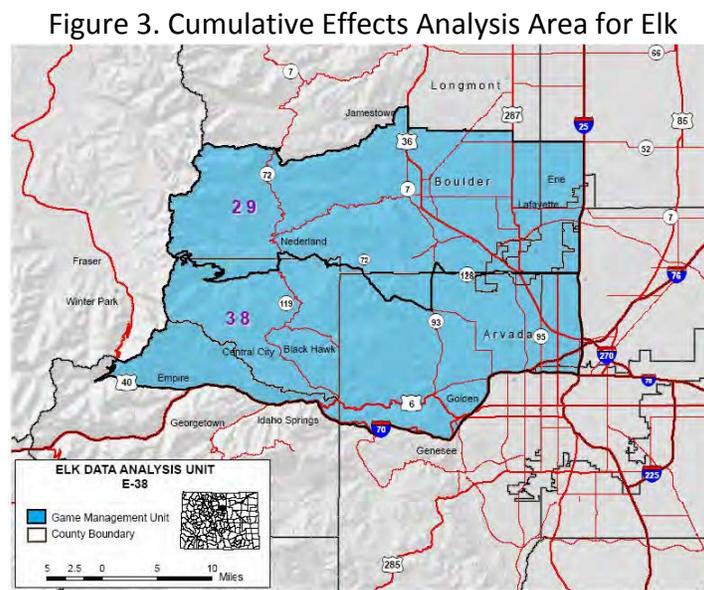
Cumulative Effects

Canada Lynx – Listed Threatened under ESA

Adding past, present and future actions to the discussion of effects above, Alternative A is not expected to contribute measurably to cumulative impacts. The determination remains that this project **may affect, is not likely to adversely affect** the Canada lynx.

Elk- Management Indicator Species

The cumulative effects analysis area for elk is the area occupied by the subherd of the Clear Creek elk herd that uses Game Management Unit (GMU) 29, which encompasses the northern portion of CPW Data Analysis Unit E-38, ranging from the Continental Divide east to the cities of Erie and Lafayette and displayed on the map below (CPW 2005).



Most or all of the past, present, and reasonably foreseeable actions listed above are impacting or have potential to impact the local elk herd and their habitats to some extent. Opportunities for elk movement have become more restricted over time, with the variety of human-associated development and use across the project area. Elk movement is limited by both physical barriers – roads, reservoirs, residences, and other structures – and barriers created by heavy and increasing human use on roads and trails in the area for residential use and a variety of recreational pursuits.

Past fuels treatments have increased available forage for elk, and proposed fuels treatment in the Forsythe II project would further increase forage in portions of the project area. Some project area trails are within areas of clearcuts and patch cuts from past fuels treatments, and other trails are within potential future fuels treatment units proposed under the Forsythe II fuels treatment project. This combination can limit elk movements spatially and temporally, as well as limit use of available forage.

As discussed above, changes in elk movement can result in habitat degradation for elk and other species, increased vehicle collisions as elk move more at night, increased exposure of elk to disease, and increased negative interaction with landowners. The myriad of habitat changes has created narrow areas where elk move between barriers to and from production areas and winter range. Examples of this include a narrow east-west forested area south of the Big Springs subdivision and north of Magnolia Road and several clearcuts, and a small area south of Eldora Road/County Road 130 between Nederland High School and the proposed Evans Annexation.

Observations by CPW and local residents suggest elk movements and use of some areas may be changing, but there are no recent studies attempting to document or quantify changes. It is difficult to predict when changes in elk movement and forage use would result in any or all of the impacts previously discussed. Population changes to the local herd are not anticipated in the foreseeable future; however it is difficult to predict when cumulative effects may begin to cause population changes. Presence and use of existing trails and roads and anticipated future creation of unauthorized trails would add to cumulative effects under Alternative A.

Mule deer- Management Indicator Species

The cumulative effects analysis area for mule deer is GMU 29, which is the northern portion of the area used by the Boulder Creek mule deer herd, and the same as the cumulative effects analysis area displayed above for elk.

Most or all of the past, present, and reasonably foreseeable actions listed above are impacting the local mule deer herd and their habitats to some extent. Opportunities for mule deer movement have become more restricted over time, with the variety of human-associated development and use across the project area. Mule deer movement is limited by both physical barriers – roads, reservoirs, residences, and other structures – and barriers created by heavy and increasing human use on roads and trails in the area for residential use and a variety of recreational pursuits.

Past fuels treatments have increased available forage for mule deer, and proposed fuels treatment in the Forsythe II project would further increase forage in portions of the project area. Some project area trails are within areas of clearcuts and patch cuts from past fuels treatments, and other trails are within potential future fuels treatment units proposed under the Forsythe II fuels treatment project. This combination can limit mule deer movements spatially and temporally, as well as limit use of available forage.

It is difficult to predict when changes in mule movement and forage use would result in changes to movement or negative habitat impacts. Population changes to the local herd are not anticipated in the foreseeable future; however it is difficult to predict when cumulative effects may begin to cause population changes. Presence and use of existing trails and roads and future creation of unauthorized trails would add to cumulative effects under Alternative A.

Forest Service Sensitive Species and Management Indicator Species Analyzed

Based on the cumulative effects analysis documented in the Wildlife report located in the project record, Alternative A is not expected to contribute measurably to cumulative effects. Determinations for Forest Service Sensitive species and estimations of influence for project MIS cumulatively would not change. Refer to Table 13 in the Summary of Determinations and Estimation of Effects section.

Alternative B – Proposed Action: Environmental Effects

Direct and Indirect Effects

Canada Lynx – Listed Threatened under ESA

Refer to Section 3.4-Wildlife and especially to “*Direct and Indirect Effects to Both Alternatives*”, for a discussion of recreation impacts to wildlife. Refer to the SRLA consistency analysis in the Wildlife Specialist Report for a discussion of effects related to SRLA guidance. As discussed under the SRLA consistency analysis above, the proposed narrow, linear trail corridors are not expected to impact connectivity, as forest cover and connections would remain. For these reasons, project activities are not expected to affect lynx movement. Because this project does not involve any vegetation treatment, no lynx habitat would be converted to an unsuitable condition. Based on these factors and the SRLA consistency analysis above, Alternative B is consistent with SRLA guidance.

Lynx productivity risk factors relevant to this project are conversion or alteration of native plant communities, recreational use, and road and trail access. Refer to the Wildlife Specialist Report for a detailed analysis discussion of effects to these factors. After analysis of the amount of new trail construction, system trails and social trails obliterated, social trails or roads converted to trails, only .58 acres of lynx habitat was lost. With over 44,000 acres of lynx habitat with the Boulder LAU, ½ acre lost is insignificant.

Additional conversion of native plant communities could occur due to introduction and spread of non-native, invasive plants from trail construction and use. Invasive plants generally favor open areas with sunlight, therefore more impacts would likely occur more readily in open areas such as meadows, which are not providing lynx habitat. For these reasons, impacts to lynx from alteration of native plants communities from invasive plants are considered insignificant and discountable.

Project area lynx habitat is somewhat remote from access points and not likely to receive high winter motorized or non-motorized use. Winter use in lynx habitat is not expected to reach levels that would consistently compact snow. Snowmobile use would be prohibited in the project area except for current permitted snowmobile use. Though snowmobile use is minimal under current conditions, some benefits to winter lynx habitat would be expected. Some roads outside of the LAU are proposed for winter grooming for non-motorized winter use. If non-motorized winter recreation use expands into the LAU, the adaptive management portion of the Proposed Action allows a seasonal closure to prohibit entrance into the LAU, which could benefit lynx winter habitat.

Determinations of Effects and Rationale

Potential disturbance to individual lynx, if lynx travel through the project area and if they are briefly disturbed by trail use, is expected to be minimal, and therefore considered insignificant and discountable. The final proposed trail system, much of it not in the LAU, is expected to affect small, linear areas of lynx habitat to an extent considered insignificant and discountable. Additional consistent snow compaction in lynx habitat is not expected. Based on these factors and the above analysis, it is determined that Alternative B ***may affect, is not likely to adversely affect*** the Canada lynx.

Elk - Management Indicator Species

The above discussion re: Influence of Alternative A also applies to Alternative B. Overall impacts under Alternative B are expected to be somewhat less than under Alternative A in the long term, due to reduced remaining trail and road miles after implementation, restriction of horse and mountain bike use to system trails, the ability of the USFS to obliterate any new social trails created post-implementation, and adaptive management including seasonal closures for wildlife if warranted. Under Alternative B, short term impacts may occur during trail rerouting, obliteration, and/or construction that would not occur under Alternative A. These impacts would be expected to be relatively small in area in a particular season, as limited implementation would occur at any one time, and limited in temporal impacts to the season of implementation in a particular area. Alternative B Design Criteria provide for adjusting project implementation timing if warranted for elk during migration or winter, which would help to limit these temporary impacts.

As discussed above, while Alternative B may influence elk movement and forage use which can result in various impacts to elk and other species, elk population impacts are not expected in the foreseeable future. Therefore, under Alternative B, **the estimation of influence is *no***

change to elk populations is expected locally or on the Planning Area.

Mule Deer - Management Indicator Species

The above discussion re: Influence of Alternative A for mule deer also applies to Alternative B. Overall impacts under Alternative B are expected to be somewhat less than under Alternative A in the long term, due to reduced remaining trail and road miles after implementation, restriction of horse and mountain bike use to system trails, the ability of the USFS to obliterate any new social trails created post-implementation, and adaptive management including seasonal closures for wildlife if warranted. Under Alternative B, short term impacts may occur during trail rerouting, obliteration, and/or construction that would not occur under Alternative A. These impacts would be expected to be relatively small in area in a particular season, as limited implementation would occur at any one time, and limited in temporal impacts to the season of implementation in a particular area.

As discussed above, while Alternative B may influence mule deer movement and forage use, mule deer population impacts are not anticipated in the foreseeable future. Therefore, under Alternative B, **the estimation of influence is no change to mule deer populations is expected locally or on the Planning Area.**

Forest Service Sensitive Species Analyzed

For Alternative B after analysis (documented in the Wildlife Specialist Report) North American wolverine, river otter, American peregrine falcon and bald eagle all had findings of **no impact** with no effects expected.

For American marten, fringed myotis, hoary bat, pygmy shrew, Townsend's big-eared bat, boreal owl, flammulated owl, northern goshawk, olive-sided flycatcher, boreal toad and northern leopard from the analysis indicated a finding of **may adversely impact individuals, but not likely to result in a loss of viability on the Planning area, nor cause a trend toward federal listing.**

Other Management Indicator Species Analyzed

Under Alternative B, the **estimation of influence is no change to all MIS populations, expected locally or on the Planning Area.**

Cumulative Effects

Canada Lynx – Listed Threatened under ESA

The Toll property trail is planned for non-motorized, non-winter use. The trail would travel through lynx habitat, and average width is expected to be approximately three feet. While

wider than the average two-foot width of trails on NFS lands, this would be a single, narrow corridor expected to cause minimal impacts to lynx habitat and connectivity. The County trail on the Toll property would be closed to winter use; therefore it would not add new areas of snow compaction. Cumulative effects to lynx habitat in the Boulder LAU include continued residential expansion into lynx habitat and fuels reduction on private lands, including defensible space around mountain residences. These activities may incrementally impact suitable lynx habitat, primarily around existing human development areas. It is not possible to quantify these activities at this time; however they generally occur in small areas at any one time, and in the foreseeable future are not expected to impact large areas of lynx habitat. In the western portion of the Boulder LAU, large areas of lynx habitat would remain intact (with the exception of wildfires or insect outbreaks should they occur) in Indian Peaks and James Peak Wilderness areas and on large parcels managed by the City of Boulder and Boulder County, and the Toll property under conservation easement.

Recreation is expected to continue to increase across jurisdictional boundaries with the increasing Front Range human population, with associated continuing creation of new travel routes, both authorized and unauthorized. Recreation on NFS lands includes motorized and non-motorized, while recreation on city and county-owned lands within the LAU is non-motorized. Traffic along state highways in and just east of the LAU is likely to continue to increase with the increasing human population; however as noted above, traffic is already at levels where lynx movement could be impacted. If lynx occur in the Boulder LAU, movement across Highways 119 and 72 may or may not occur, as most lynx habitat is west of these highways. Large areas of lynx habitat in the LAU in Wilderness areas, the Toll property, and City of Boulder and Boulder County lands would remain relatively intact and protected from development.

Fuels treatment can impact lynx habitat, but measures are included to maintain lynx habitat, and trees would regrow over time. Ski runs and power line clearing result in long-term conversion of lynx habitat to non-habitat. Restoration in Caribou and Jenny Creek areas have improved some lynx habitat.

The proposed project would permanently change a net of less than one acre of lynx habitat, and disturbance, if any, to individual lynx should they pass through the project area is estimated to be insignificant and discountable. Therefore, the proposed project is expected to add immeasurably to cumulative impacts.

Determinations of Effects and Rationale

Adding past, present and future actions to the discussion of effects above, Alternative B is not expected to contribute measurably to cumulative impacts. The determination remains that this project ***may affect, is not likely to adversely affect*** the Canada lynx.

Elk and Mule Deer – Management Indicator Species

Cumulative effects to elk and mule deer under Alternative A are similar to those discussed under Alternative B. For both species, Alternative B would be expected to add to cumulative

effects, but somewhat less than Alternative A, based on lower total trail and road mileage remaining after implementation. Also, effects from adoption of social trails as system trails and creation of new trails would be partially offset by obliteration of some existing social trails and future obliteration of newly created trails. Restriction of mountain biking and horseback riding to system trails after implementation would further reduce the contribution of Alternative B to cumulative effects for elk and mule deer.

Forest Service Sensitive Species and Management Indicator Species Analyzed

Based on the above cumulative effects analysis, determinations for Forest Service Sensitive species and estimations of influence for project MIS did not change for Alternative B from the analyses presented in previous sections.

Summary of Determinations and Effects to Wildlife Species

For species selected for analysis, the table below presents, by Alternative, determinations of effects for federally Threatened and Forest Service Sensitive species, and estimations of effects for MIS.

Table 13. Summary of Wildlife Determinations /Estimation of Effects

Common Name	Species	Status	Alternative A No Action	Alternative B Proposed Action
Canada lynx	<i>Lynx Canadensis</i>	Threatened	NLAA ¹	NLAA
American Marten	<i>Martes americana</i>	Sensitive	No Impact	MAII ²
Fringed myotis	<i>Myotis thysanodes</i>	Sensitive	No Impact	MAII
Hoary bat	<i>Lasiurus cinereus</i>	Sensitive	No Impact	MAII
North American Wolverine	<i>Gulo gulo</i>	Sensitive	No Impact	No Impact
Pygmy shrew	<i>Sorex hoyi</i>	Sensitive	MAII	MAII
River Otter	<i>Lontra canadensis</i>	Sensitive	No Impact	No Impact
Townsend's big-eared bat	<i>Plecotus townsendii</i>	Sensitive	No Impact	MAII
American peregrine falcon	<i>Falco peregrinus anatum</i>	Sensitive	No Impact	No Impact
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Sensitive	No Impact	No Impact
Boreal owl	<i>Aegolius funereus</i>	Sensitive	No Impact	MAII
Flammulated owl	<i>Otus flammeolus</i>	Sensitive	No Impact	MAII
Northern goshawk	<i>Accipiter gentilis</i>	Sensitive	MAII	MAII
Olive-sided flycatcher	<i>Contopus borealis</i>	Sensitive	No Impact	MAII
Boreal toad	<i>Bufo boreas boreas</i>	Sensitive and Project MIS	MAII No change ³	MAII No change
Northern leopard frog	<i>Rana pipiens</i>	Sensitive	MAII	MAII
Elk	<i>Cervus elaphus</i>	Project MIS	No change	No change

Common Name	Species	Status	Alternative A No Action	Alternative B Proposed Action
Mule deer	<i>Odocoileus hemionus</i>	Project MIS	No change	No change
Golden-crowned kinglet	<i>Regulus satrapa</i>	Project MIS	No change	No change
Hairy woodpecker	<i>Picoides villosus</i>	Project MIS	No change	No change
Mountain bluebird	<i>Sialia currucoides</i>	Project MIS	No change	No change
Pygmy nuthatch	<i>Sitta pygmaea</i>	Project MIS	No change	No change
Warbling vireo	<i>Vireo gilvus</i>	Project MIS	No change	No change
Wilson's warbler	<i>Wilsonia pusilla</i>	Project MIS	No change	No change

¹ May affect, not likely to adversely affect.

² May adversely impact individuals, but not likely to result in a loss of viability in the Planning area, nor cause a trend toward federal listing

³ No change to ARP MIS populations; but habitat changes vary by species (see preceding text for details).

Fish and Aquatic Insects Species:

Alternative A – No Action: Existing Condition

The waterbodies of the project area include: steep tributaries to South Boulder Creek above Rollinsville, Beaver Creek, upper reaches of Forsythe Canyon Creek and, steep tributaries to Middle Boulder Creek (generally below Nederland) and the Los Lagos Lateral Ditch. There are also 6 small unnamed lakes, ponds and/or reservoirs within the project boundary. Several waterbodies within the project drain to waters outside the project boundary.

The project area contains very few perennial channels and instead encompasses mostly ephemeral or intermittent headwaters that are tributary channels to more substantial waterbodies bordering the project area. Beaver Creek, one of the few perennial bodies, though not surveyed in the past, likely supports a modest population of brook trout similar to what is found in nearby tributaries in that HUC-6 watershed of South Boulder Creek (USDA Forest Service 1998) and would be expected in that watershed at that elevation. Though there is suitable habitat within the project area for the threatened greenback cutthroat trout, this species is not known to exist within the project area. The ephemeral and intermittent channels and ponds are not likely to support populations of trout, but could potentially support forest sensitive species such as Arapahoe snowfly and Hudsonian Emerald dragonfly.

There are several known wetlands within the project area but extensive “on the ground” inventory of wetlands, meadows and riparian areas has not been completed. However, extensive surveys of the trail/road network were completed and focus was given towards identifying locations near waterbodies where the proposed transportation network would have potential to influence them). As evidenced by field review, very few locations exist within the project area with direct or indirect contact to aquatic habitats.

Review via ArcMap showed a wider extent of crossings in the area, but many of those crossings are in locations that are part of the existing conditions (dam crossings, road culvert crossings, existing system trail), are on the Los Lagos Ditch (poor habitat), or were never actually located on the ground and do not match the National Hydrography Dataset flowline data for the forest.

The Arapahoe snowfly is currently known to inhabit intermittent, ephemeral, and perennial channels that are tributaries to larger streams across low to mid elevations of the Front Range up to elevations of 6719 feet (Belcher 2015). The potential habitat for the project area would lie between 7900ft and 8600ft along the lower elevation reaches. The species is known to occur in tributaries to Middle and South Boulder Creeks at lower elevations (Heinhold et al). Its presence at higher elevations within the project area are not known, but are possible as distribution is not entirely established.

The emerald dragonfly is known to inhabit primarily lentic systems like bog lakes but also some stream corridors above 5000ft. (Packauskas 2005). At that elevation the project area could certainly hold viable habitat for the dragonfly. While there are not any known habitats in the project area there are some natural ponds and lakes as well as impoundments that would create this type of habitat and the nearby area hosts several known habitats including Teller Lakes, Eldora Lakes, and South Boulder Park and others all within a 40 mile radius of Boulder, CO as described in the species conservation assessment making it likely that the species could be found in the project area

Alternative A – No Action: Environmental Effects

Direct and Indirect Effects

Alternative A finding for greenback cutthroat trout, a threatened species is **“no effect”** to aquatic habitats and threatened, endangered, proposed or sensitive fish species.

For sensitive species the finding: for lake chub and northern redbelly dace are **“no impact”**; the two macroinvertebrates, Arapahoe snowfly and the Hudsonian emerald dragonfly are **“may adversely impact individuals, but not likely to result in a loss of viability in the Planning area, nor cause a trend toward federal listing”**. There are no effects to Management Indicator Species (see Table 14, below).

Cumulative Effects

There are no additional cumulative effects.

Alternative B – Proposed Action: Environmental Effects

Direct and Indirect Effects

For Alternative B-Proposed Action, aquatic habitats and fisheries resources would not be affected directly by the trail construction or adaptive management strategy for the trail

network. Work and the trail system itself is generally well removed from stream corridors and other aquatic habitats. The adaptive management strategy employed for the trail network would garner an ability to continually assess conditions and rapidly address resource concerns.

Indirect effects would be more common, but the use of the design criteria derived from the *Forest Plan* Standards and Guidelines and the development of an adaptive management strategy are used in the design of the project and would, therefore, preclude much of the adverse direct and indirect effects of project implementation (USDA Forest Service 1997).

The primary indirect effect of the proposal would be erosion and stream sedimentation. Erosion and sedimentation in waterbodies are known to reduce habitat diversity and productivity for potential fish and macroinvertebrates by filling pools (Bjornn, et al., 1977), filling of interstitial spaces (Bjornn and Reiser 1991, Waters 1995), and reducing streambed diversity (Waters 1995). These habitat changes in these streams would likely lead to a loss of stream insect diversity (Erman and Erman 1984, Beisel et al. 2000), loss of benthic macroinvertebrate abundance (Richards and Bacon 1994, Kaller and Hartman 2004), and loss of stream productivity (Cardinale et al. 2000).

The degree and duration of these impacts is dependent upon the number of new stream crossings (2-3), effectiveness of riparian areas to filter out sediment, sustainability of the trail network as implemented, monitoring of new user-created trail, and the effectiveness and permanency of trail obliterations. In many places on the existing trail network, poor trail alignment, lack of effective drainage and/or lack of routine maintenance are largely responsible for existing erosion and increased potential for ongoing erosion. The proposed trail network, however, reduces the current footprint of the system and improves sustainability of the network overall through appropriate design criteria which would require that all trails in the final trail system would be aligned, designed, repaired, maintained and/or restored to avoid, lower or minimize impacts on soils, riparian vegetation, wetlands and stream channels.

The implemented trail network should create improved habitat conditions because of how soil and watershed resources would be protected (USDA Forest Service 2015A). With implementation of the recommended design criteria, the trail network would be more sustainable and reduce further resource damage of user-created ways and unsustainable system ways that currently or would otherwise contribute greater than normal amounts of sediment to waterbodies. Generally watershed, soil and aquatic resources benefit through improving trail alignments, improving drainage, implementing restoration actions where needed and providing a flexible adaptive management approach to identify and implement trail maintenance and/or other response actions if, when and where needed.

The determinations and findings for all species considered whether PTES or MIS are the same as Alternative A.

This following table documents the direct and indirect effects to listed (threatened and endangered) aquatic fauna and overall effects to sensitive species as well as management indicator species related to this project.

Table 14. Summary of Species Occurrence, Habitat Occurrence and Project Effects for ESA-Listed Fish and Aquatic Insect Species, Region 2 Sensitive Species and Management Indicator Species

Species	Habitat Present	Habitat Absent	Species Present	Species Absent	No Action and Proposed Action Effects	Cumulative Effects
Endangered						
Bonytail chub [‡] <i>Gila elagans</i>		X		X	None.	None
Humpback chub [‡] <i>Gila cyhpa</i>		X		X	None.	None
Colorado squawfish [‡] <i>Ptychocheilus lucius</i>		X		X	None.	None
Razorback sucker [‡] <i>Xyrauchen texanus</i>		X		X	None	None
Pallid sturgeon [†] <i>Scaphirhynchus albus</i>		X		X	None	None
Threatened						
Greenback cutthroat trout <i>Oncorhynchus clarki stomias</i>	X			X	Suitable habitat within project area, species not known to exist within project area. No effect	None
Sensitive Species						
Flannelmouth sucker <i>Catostomus discolobus</i>		X		X	None	None
Mountain sucker <i>Catostomus platyrhynchus</i>		X		X	None	None
Colo. River cutthroat trout <i>Oncorhynchus clarki pleuriticus</i>		X		X	None	None
Lake chub <i>Couesius plumbeus</i>	X			X	Suitable habitat within project area, species not known to exist within project area. No impact	None
Northern redbelly dace <i>Phoxinus eos</i>	X			X	Suitable habitat within project area, species not known to exist within project area. No impact	None
Plains topminnow <i>Fundulus sciadicus</i>		X		X	None	None
Hudsonian emerald <i>Somatochlora hudsonica</i>	X		X		Suitable habitat present in project area, species may be in project area. Project unlikely to disturb potential habitat. May adversely impact individuals, but not likely to result in a loss of viability in the Planning area, nor cause a trend toward federal listing	None
Arapahoe snowfly <i>Arsapnia arapahoe</i>	X		X		Suitable habitat present in project area, species may be in project area. Project unlikely to disturb potential habitat. May adversely impact individuals, but not likely to result in a loss of viability in the Planning area, nor cause a trend toward federal listing	None
Rocky Mountain Capshell		X		X	None	None

Species	Habitat	Habitat	Species	Species	No Action and Proposed Action Effects	Cumulative Effects
	Present	Absent	Present	Absent		
Management Indicator Species:						Viability Impact
Greenback cutthroat trout <i>Oncorhynchus clarki stomias</i>		X		X	None	None
Colo. River cutthroat trout <i>Oncorhynchus clarki pleuriticus</i>		X		X	None	None
Brook trout <i>Salvelinus fontinalis</i>	X		X		None	None
Brown trout <i>Salmo trutta</i>	X		X		None	None
Plains topminnow <i>Fundulus sciadicus</i>		X		X	None	None
Plains killifish <i>Fundulus zebrinus</i>		X		X	None	None

† Pallid sturgeon are native to the Mississippi and Missouri Rivers. Water depletions from any portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery populations.

‡ Bonytail chub, humpback chub, Colorado squawfish, and razorback sucker are endemic to the Colorado River Basin and occur in mid to large order streams not found of the Arapaho-Roosevelt National Forest. Water depletions from any portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery populations.

Cumulative Effects

Past and current projects in the project area or downstream have the potential to create some limited or localized impacts to sensitive species or MIS species. Those projects include several fuels projects, a ski area expansion, hazard tree mitigation, and increased management of adjacent non-federal county lands. The expected impacts to sensitive or MIS species are related to increases in disturbance to uplands that increase erosion and sedimentation to waterbodies. The expected cumulative impacts of increased sediment are largely mitigated through design criteria of the projects and the discrete nature of the populations of the sensitive species in question. In the case of this project there is little overlap of cumulative impacts in time and space of the project area. Potential populations of snowfly and emerald dragonfly would be located in such a manner that impacts would not likely overlap and therefore cumulative impacts would be minimal or not likely.

Plants:

Alternative A – No Action: Existing Condition

Proposed, Threatened, and Endangered Species

Table 15 includes federally listed or proposed plant species determined to possibly be located on the ARP and any federally listed or proposed species located downstream that could potentially be affected by a project. No Threatened, Endangered or Proposed species were analyzed for this project.

Table 15. Federally Listed Plant Species Considered For Analysis

Common Name	Species	Status	MIS/Indicator Community	Species Excluded	Reason for Exclusion
Ψ *Colorado butterfly plant	<i>Gaura neomexicana</i> ssp. <i>coloradensis</i>	Threatened	No	Yes	No influence on species or habitat/no water depletions
*Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	Threatened	No	Yes	No influence on species or habitat/no water depletions
North Park Phacelia	<i>Phacelia formosula</i>	Endangered	No	Yes	No suitable habitat in project area
ΨOsterhout milkvetch	<i>Astragalus osterhoutii</i>	Endangered	No	Yes	Not near species or habitat
Penland beardtongue	<i>Penstemon penlandii</i>	Endangered	No	Yes	Not near species or habitat
*Western prairie fringed orchid	<i>Platanthera praeclara</i>	Threatened	No	Yes	Not near species or habitat/no water depletions

Ψ Suspected to occur but unconfirmed on the Arapaho and Roosevelt National Forests.

* Could be affected by downstream water depletions.

Sensitive Species

The ARP received the Region 2 Forest Service Sensitive Species list, dated August 29, 2015, from the Regional Forester. The following list includes current sensitive species found within or suspected on the ARP. Complete lists by Region and Forests/Grassland can be found as an attachment to the Biological Report for Plants in the project record. The species noted as excluded on the table below will not be discussed further. Some species are excluded from analysis due to elevation. Generally this means that the proposed project is outside the species known elevation range for this particular latitude.

Table 16. Region 2 Forest Service Sensitive Plant Species Considered For Analysis

Common Name	Species	Elevation (feet)	Plant Phenology	Excluded	Reason for Exclusion
Ψ Sea pink	<i>Armeria maritima</i> var. <i>siberica</i>	11,900-13,000	Fl: July, Fr: August	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
☀ Dwarf milkweed	<i>Asclepias uncialis</i>	4000-6500	Fl: Late April-May Fr: June-Early July	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Ψ Park milkvetch	<i>Astragalus leptaleus</i>	7675-9500	Fl: June to Aug	No	
☀ Prairie moonwort	<i>Botrychium campestre</i>	3700-10,800	Emerges in May	No	
Lesser-panicked sedge	<i>Carex diandra</i>	6100-9600	Fr: Late May – mid-August	No	
Livid sedge	<i>Carex livida</i>	9000-		Yes	Project is outside the elevation

Common Name	Species	Elevation (feet)	Plant Phenology	Excluded	Reason for Exclusion
		10,000			range of this species and no suitable habitat exists.
☼ Sandhill goosefoot	<i>Chenopodium cycloides</i>	4000-5500	Fl: July-August Fr: Aug-Sept	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Yellow lady's-slipper	<i>Cypripedium calceolus</i> spp. <i>parviflorum</i>	7400-8500	Fl: June-July	No	
Clawless draba	<i>Draba exunguiculata</i>	12,000-14,000	Fl: Late June-July Fr: Early August	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Gray's peak whitlow-grass	<i>Draba grayana</i>	11,500-14,000	Fl: July-August Fr: Aug-Sept	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Roundleaf sundew	<i>Drosera rotundifolia</i>	9100-9600	Fl: July	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Dropleaf buckwheat	<i>Eriogonum exilifolium</i>			Yes	Not near species or habitat
Slender cotton grass	<i>Eriophorum gracile</i>	8100-12,000	Fr: July-September	No	
Hall's fescue	<i>Festuca hallii</i>	11,000-12,000	Fl, Fr: July-August	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Ψ Weber's scarlet-gilia	<i>Ipomopsis aggregata</i> ssp. <i>weberi</i>	8000-9600	Fl: July	Yes	Species is endemic to West Slope of Colorado and southern Wyoming
Simple kobresia	<i>Kobresia simpliciuscula</i>	8900-12,800	Fl, Fr: July-August	Yes	No suitable habitat.
Colorado tansyaster	<i>Machaeranthera coloradoensis</i>			No	
Ψ Adder's-mouth	<i>Malaxis brachypoda</i>	7200-8000	Fl: July Fr: August	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Budding monkeyflower	<i>Mimulus gemmiparus</i>	8500-10,500	Fl: Mid-July	No	
Kotzebue grass-of-Parnassus	<i>Parnassia kotzebeui</i>	10,000-12,000	Fl: June-July Fr: July-August	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Ψ Harrington beardtongue	<i>Penstemon harringtonii</i>	6800-9200	Fl: June Fr: July-August	Yes	Not near species or habitat.
Rock cinquefoil	<i>Potentilla rupincola</i>	6900-10,500	Fl: Mid-June to August	No	
Tundra buttercup	<i>Ranunculus karelinii</i>	12,000-14,000	Fl: July Fr: August	Yes	Project is outside the elevation range of this species and no suitable habitat exists.
Dwarf raspberry	<i>Rubus arcticus</i>	8600-9700	June-July	No	
Silver willow	<i>Salix candida</i>	8800-10,600	Fl: May-June	No	
Ψ Autumn willow	<i>Salix serissima</i>	7800-10,200	Fl: May-July Fr: Late July-September	No	
Sphagnum moss	<i>Sphagnum angustifolium</i>	subalpine		No	
Lesser bladderwort	<i>Utricularia minor</i>	8200-10,950	Not available	No	
Ψ Selkirk violet	<i>Viola selkirkii</i>	8500-9100	Fl: May-June	No	

Ψ These species are suspected to occur but unconfirmed on the ARP.

☼ These species are suspected to occur but unconfirmed on the Pawnee National Grassland.

Management Indicator Species

There are no plant MIS for the ARP.

Alternative A-No Action and Alternative B-Proposed Action: Environmental Effects

Direct and Indirect Effects

Proposed, Threatened, and Endangered Species

There are no known or expected occurrences or suitable habitat within the project area, nor are there any downstream water depletions, therefore, there are no effects to listed species for either alternative.

Sensitive Species

For Alternative A and with the design criteria listed for Alternative B-Proposed Action (see Chapter 2 of this EA) a finding of “No Impact” has been determined for Region 2 Sensitive plant species analyzed.

CHAPTER 4 – OTHER DISCLOSURES

4.1 Findings Required by Other Laws and Regulations _____

I have determined that Alternative B would be consistent with the 1997 *Forest Plan* goals and objectives and forest-wide and management area standards and guidelines, with an exception of the *Forest Plan* direction for effective habitat for wildlife. However, because the existing condition of the project area currently does not meet this direction and the proposed action is improving the effective habitat from the existing condition, this project complies with the National Forest Management Planning Act of 1976. In addition, implementation and effects of this decision would be consistent with the following Acts and Executive Orders:

- Architectural Barriers Act (ABA) of 1968
- Americans with Disabilities Act (ADA) of 1990
- Archaeological Resource Protection Act of 1978
- Clean Air Act of 1955, as amended
- Clean Water Act of 1948, as amended
- Endangered Species Act of 1973, as amended
- Fish and Wildlife Coordination Act of 1934, as amended
- Forest and Rangeland Renewable Resources Planning Act of 1974
- Multiple-Use Sustained Yield Act of 1960
- National Environmental Policy Act of 1969, as amended
- National Historic Preservation Act (NHPA) of 1966, as amended
- Organic Administration Act of 1897
- Safe Drinking Water Act of 1974, as amended
- Protection of Wetlands Executive Order 11990

I have determined that Alternatives A or B would not have any overall differences in their effects on minorities, Native American Indians, women, or the civil liberties of any American citizen. I have also determined that implementing the proposed action would not have a disproportionately adverse health or environmental effect on any low-income or minority populations, and would affect all persons who visit the area equally (Environmental Justice: In accordance with Executive Order 12898)

CHAPTER 5 – FINDING OF NO SIGNIFICANT IMPACT

5.1 Finding of No Significant Impact _____

As the responsible official, I am responsible for evaluating the effects of the project relative to the definition of significance established by the CEQ Regulations (40 CFR 1508.13). I have reviewed and considered the EA and documentation included in the project record, and I have determined that the proposed action would not have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. My rationale for this finding is as follows, organized by sub-section of the CEQ definition of significance cited above.

Context

The context of the environmental effects is based on the environmental analysis in this EA. *Context* means that the significance of an action must be analyzed in several ways such as society as a whole (human, national), in the affected region, the affected interests, and the locality. This project is located in a popular recreation area, south of the community of Nederland. Visitors, come from Nederland, from other mountain communities and mountain homes, from the Front Range cities of Colorado and to a lesser extent from outside of Colorado. The effects of implementing the Proposed Action are localized, with implications only for the immediate vicinity of the project area. Cumulative effects of past management, combined with the current proposal and reasonably foreseeable future actions, are displayed and analyzed in the EA for the identified issues.

Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis of this EA and the references in the project record. The effects of this project have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained from field visits. My finding of no significant impact is based on the context of the project and intensity of effects using the ten factors identified in 40 CFR 1508.27(b).

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect would be beneficial.

I have considered both the beneficial and adverse impacts as presented in the EA if the Proposed Action were implemented. The Proposed Action would provide recreational

benefits to many users of the Forest and would improve recreation opportunities on NFS lands. Though some neighboring landowners may believe that these recreation opportunities affect them negatively, this does not rise to a level of significance, nor would I make a decision on anything but NFS lands. If I move ahead with selecting Alternative B in my future decision, I plan to work collaboratively with these neighboring landowners during the design and layout of trails. Impacts to recreation, water, wetlands, soils, vegetation and wildlife are thoroughly documented in Chapter 3 of the EA and are determined to be non-significant. The existing condition (Alternative A) for effective habitat is below *Forest Plan* direction. Alternative B to a small extent is improving effective habitat and moving towards *Forest Plan* guidance by removing miles of social trails and eliminating cross country travel (horse and bike). This, therefore, does not negatively impact wildlife dependent on effective habitat while providing an enhanced non-motorized recreation opportunity. My finding of no significant environmental effects is not biased by the beneficial effects of the action.

2. The degree to which the proposed action affects public health or safety.

The proposed action would not significantly affect public health or safety, but would improve signing to help the public understand what type of trail they might encounter and would help the public negotiate the trail system with less likelihood of getting lost. Trails would be designed to not only be sustainable, but would be designed for an enjoyable and safe trail experience (see Chapter 3, Section 3.2 Recreation, Alternative B: Proposed Action – Environmental Effects.)

3. Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

There are no parklands, prime farmlands, wild and scenic rivers, or ecologically critical areas within the project area. There is one known historic property (a segment of the Rollinsville and Middle Park Wagon Road) within the project area. By adhering to the proposed action's construction standards and design criteria, impacts to soils, water, wetlands, wildlife and cultural resources would not be significant. My determination is based on the discussion of effects found in the EA, Chapter 3 and the Issues Considered but Not Analyzed Further in Chapter 1.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The effects on the quality of the human environment are not likely to be highly controversial. Controversy, in this context, refers to opposing scientific opinions, not public opposition to a project. The actions planned as part of this project are commonly implemented types of activities for non-motorized trails on public lands.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The various actions proposed in Alternative B are commonly done on NFS lands. The analysis shows the effects are not uncertain, and do not involve unique or unknown risks. The key resources have been adequately analyzed and design measures have been identified and included in the proposed action. Therefore, based on the Forest Service's experience with implementing these types of activities, as well as the requirement to implement design criteria to minimize effects, I have determined that there would be no significant effects on the human environment.

6. The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.

I have determined that the proposed action does not establish precedence for future actions with significant risks to the environment. The actions included in the proposed action are common for non-motorized trail systems on NFS lands.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

The Cumulative Effects analyses presented for each resource throughout Chapter 3 in the EA discloses a series of past, present, and reasonably foreseeable future actions with potential to lead to impacts, which are cumulative in nature. The analysis does not identify any cumulatively significant impacts that are anticipated to result from implementation of Alternative B.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

As indicated in Issues Considered but Not Analyzed Further in Chapter 1, Section 1.8 of the EA, there is one known historic property (a segment of the Rollinsville and Middle Park Wagon Road) within the project area. By adhering to the proposed action's design criteria for cultural resources there would not be significant effects. As stated in the design criteria, "If additional prehistoric or historic materials are found during the course of this project, work in that area would cease until the District Ranger has been notified. Work in the area of the cultural resource may not resume until a professional archaeologist has evaluated the cultural materials and potential effects. The discovery must be protected until notified in writing to proceed by the authorized officer (36 CFR 800.110 & 112, 43 CFR 10.4)."

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

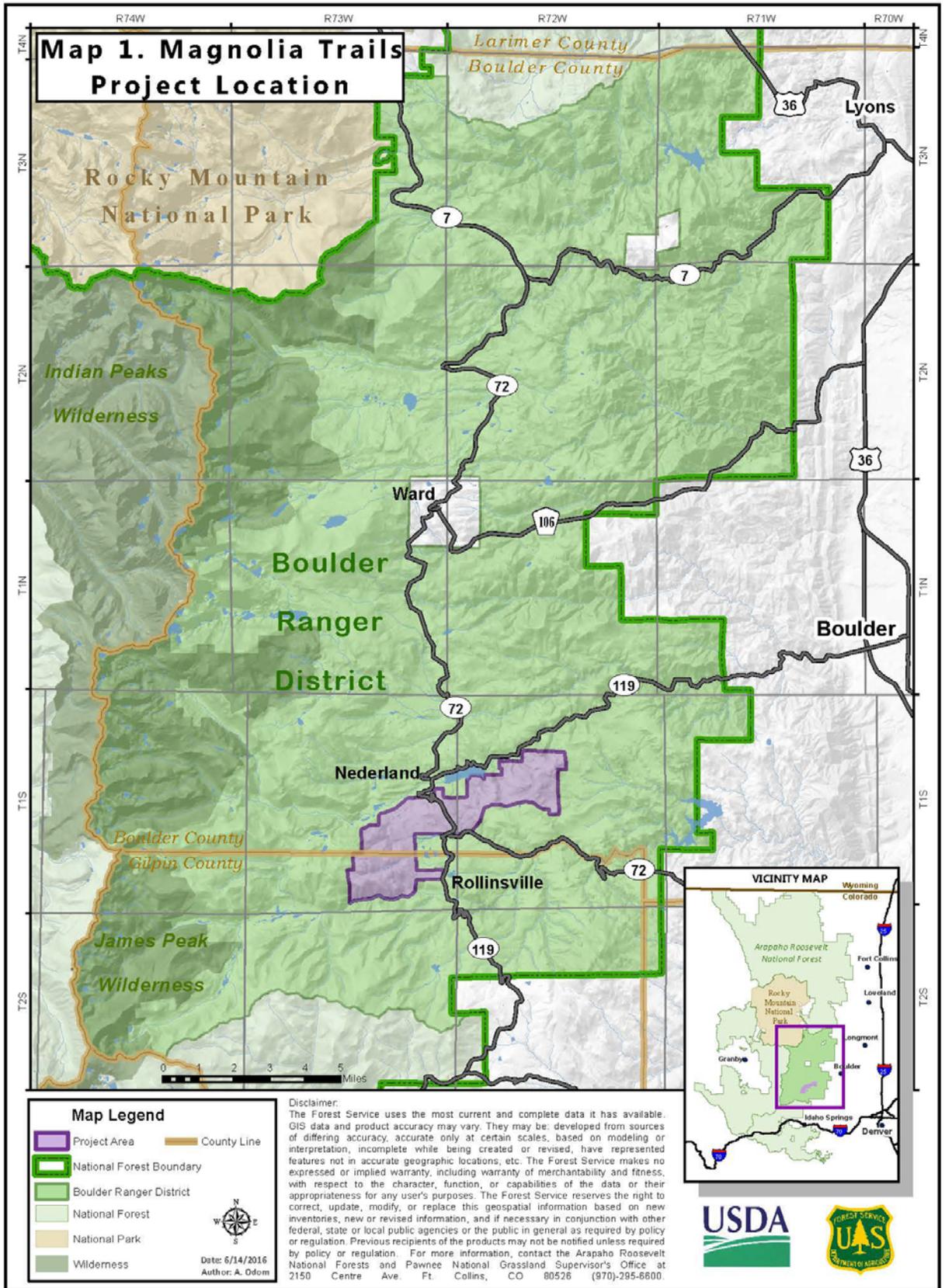
Based on my review of the determinations from biological documents prepared for this project (see project record) and summarized in the Environmental Assessment, I have found that if I decide to implement the proposed action that it would not result in significant adverse effects to any federally listed plant or animal species or its habitat. The proposed action would be consistent with all applicable project level conservation measures in the *Canada Lynx Conservation Assessment and Strategy* and all applicable objectives, standards, and guidelines in the *Southern Rockies Lynx Amendment Management Direction*. The finding for lynx is may affect, but is not likely to adversely affect, which is below the level of significant effect. A full discussion of threatened, endangered species and their habitat can be found in Chapter 3, Section 3.5.

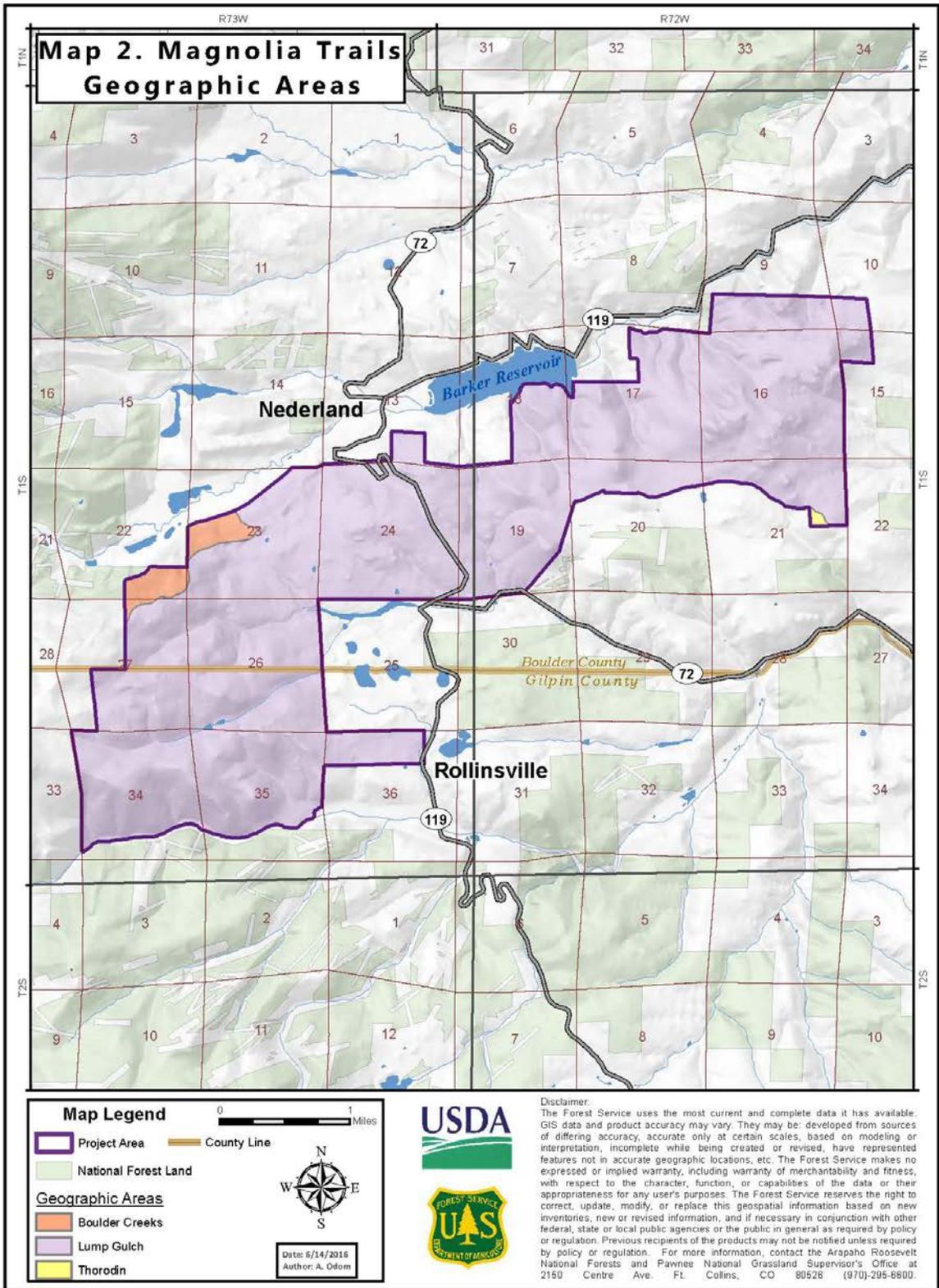
10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

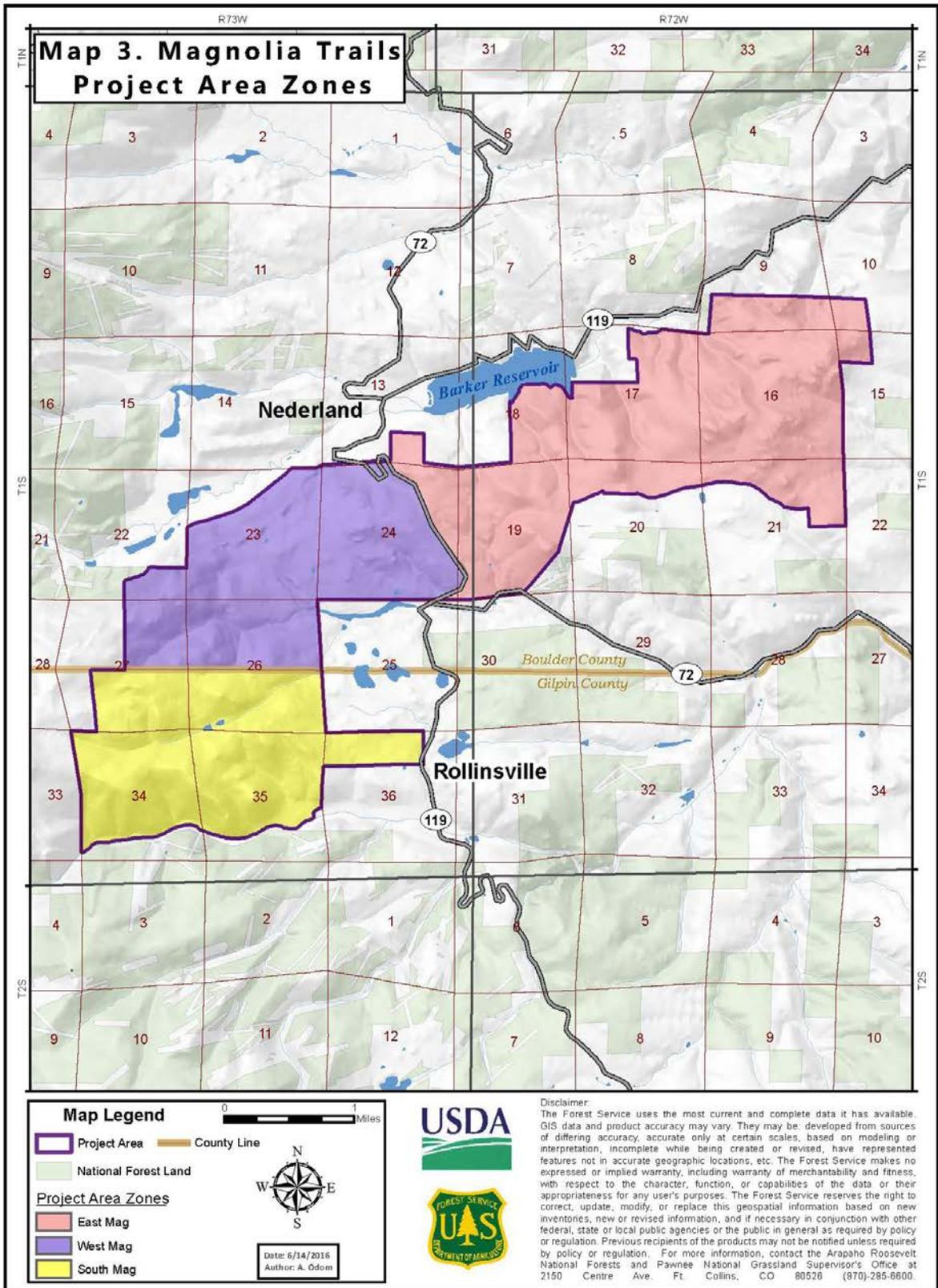
I have reviewed the EA, Biological Assessment, and the project file and have determined that no federal, state, or local laws, regulations, or requirements for protection of the environment would be violated if I select Alternative B. These laws and requirements are detailed in the previous section.

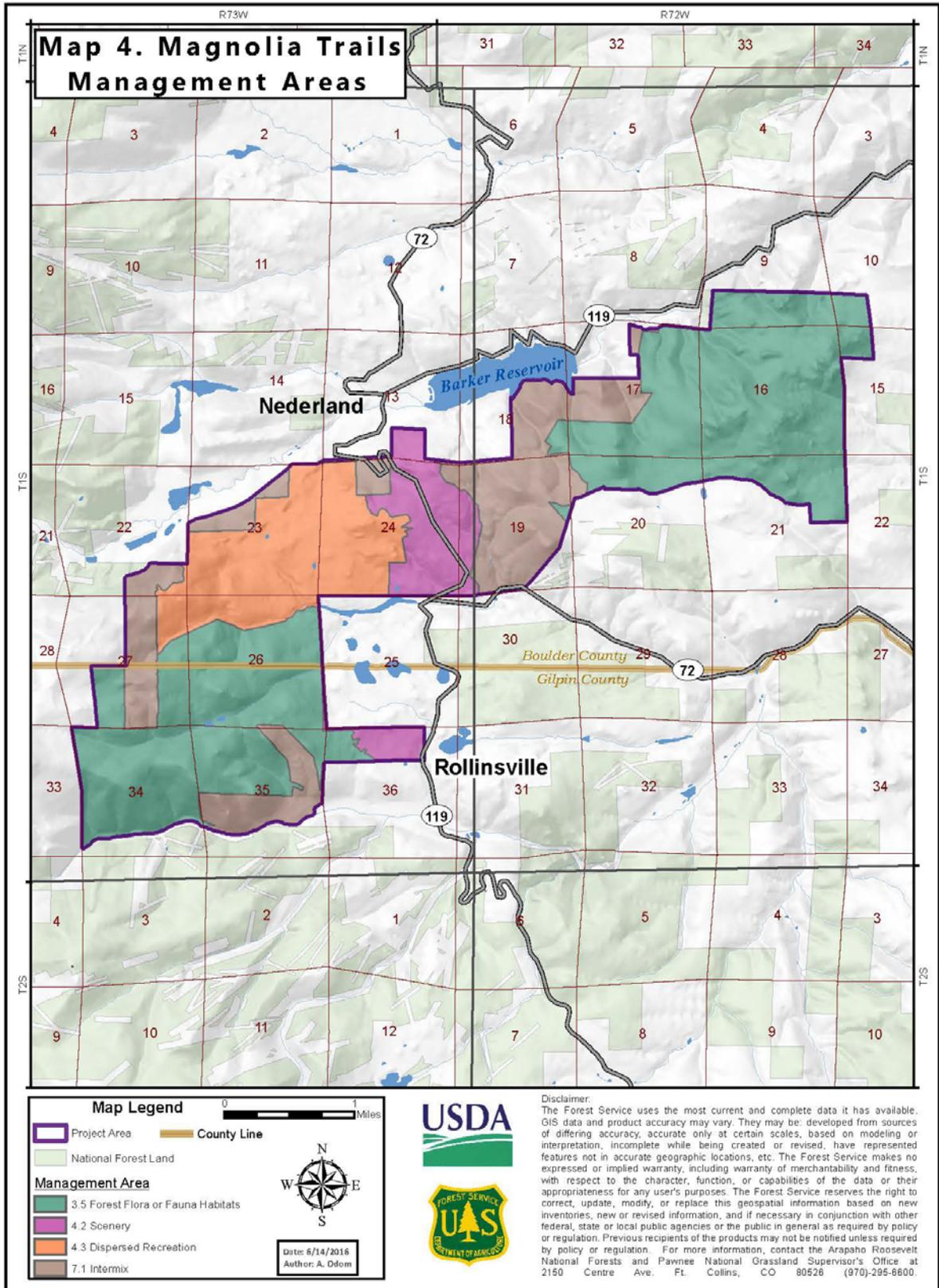
APPENDIX A - PROJECT MAPS

- Map 1. Project Location
- Map 2. Geographic Areas
- Map 3. Project Area Zones
- Map 4. Management Areas
- Map 5. Existing Condition – No Action Alternative
- Map 6. Proposed Action Alternative
- Map 7. Final Proposed System
- Map 8. Lynx Analysis Unit

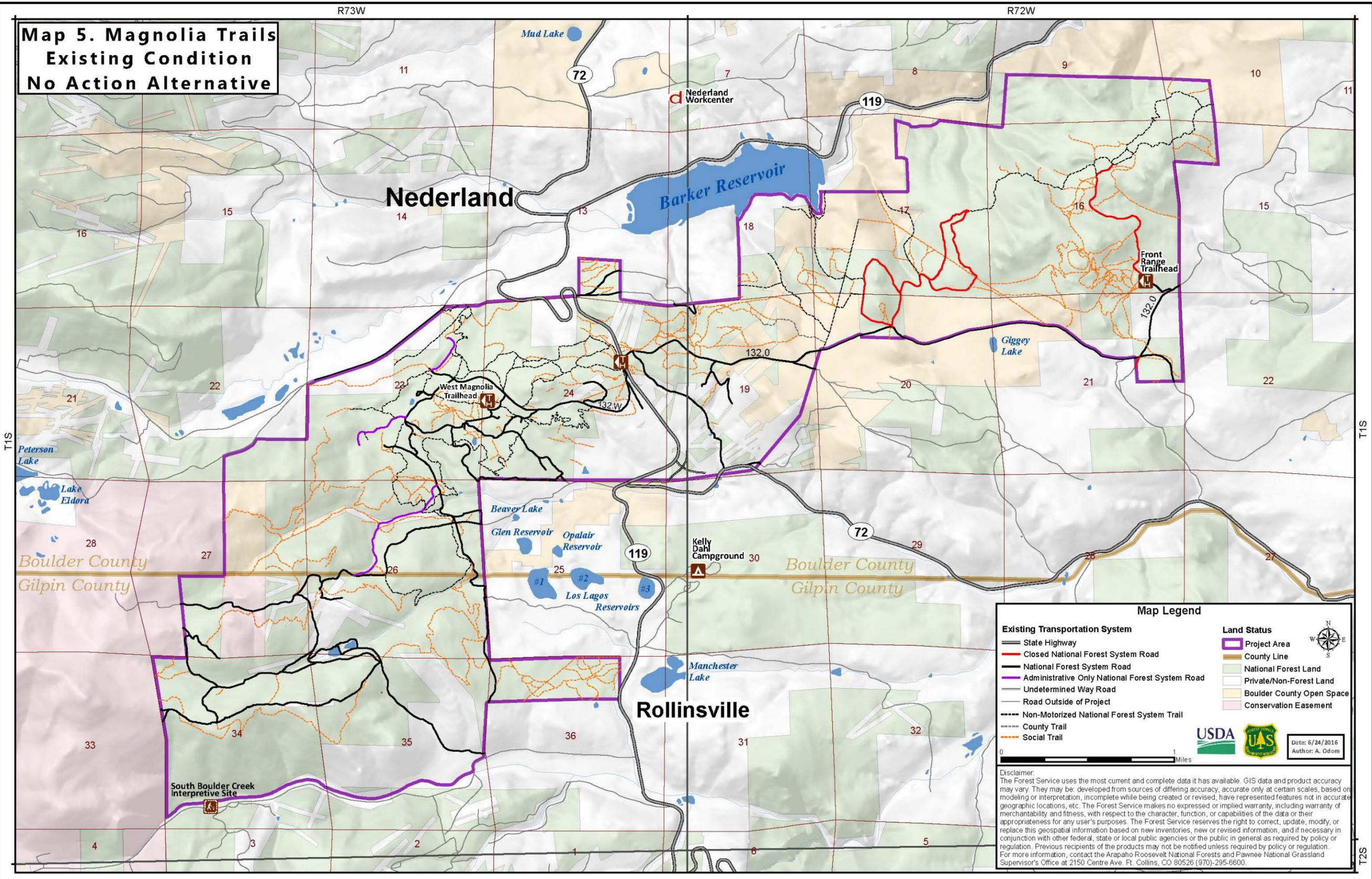








**Map 5. Magnolia Trails
Existing Condition
No Action Alternative**



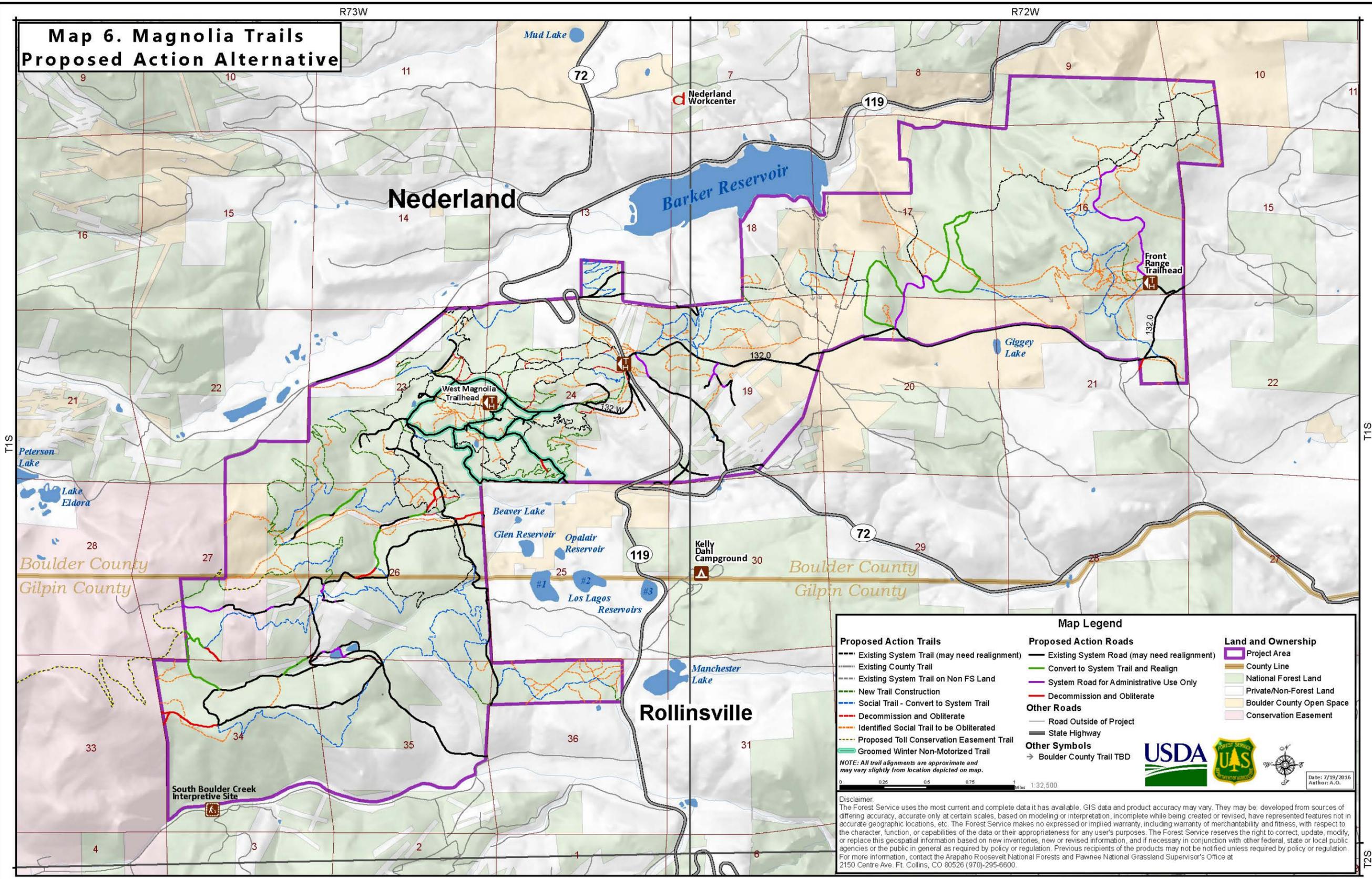
Map Legend

Existing Transportation System	Land Status
— State Highway	Project Area
— Closed National Forest System Road	County Line
— National Forest System Road	National Forest Land
— Administrative Only National Forest System Road	Private/Non-Forest Land
— Undetermined Way Road	Boulder County Open Space
— Road Outside of Project	Conservation Easement
--- Non-Motorized National Forest System Trail	
--- County Trail	
--- Social Trail	

Date: 6/24/2016
 Author: A. Odom

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Map 6. Magnolia Trails Proposed Action Alternative



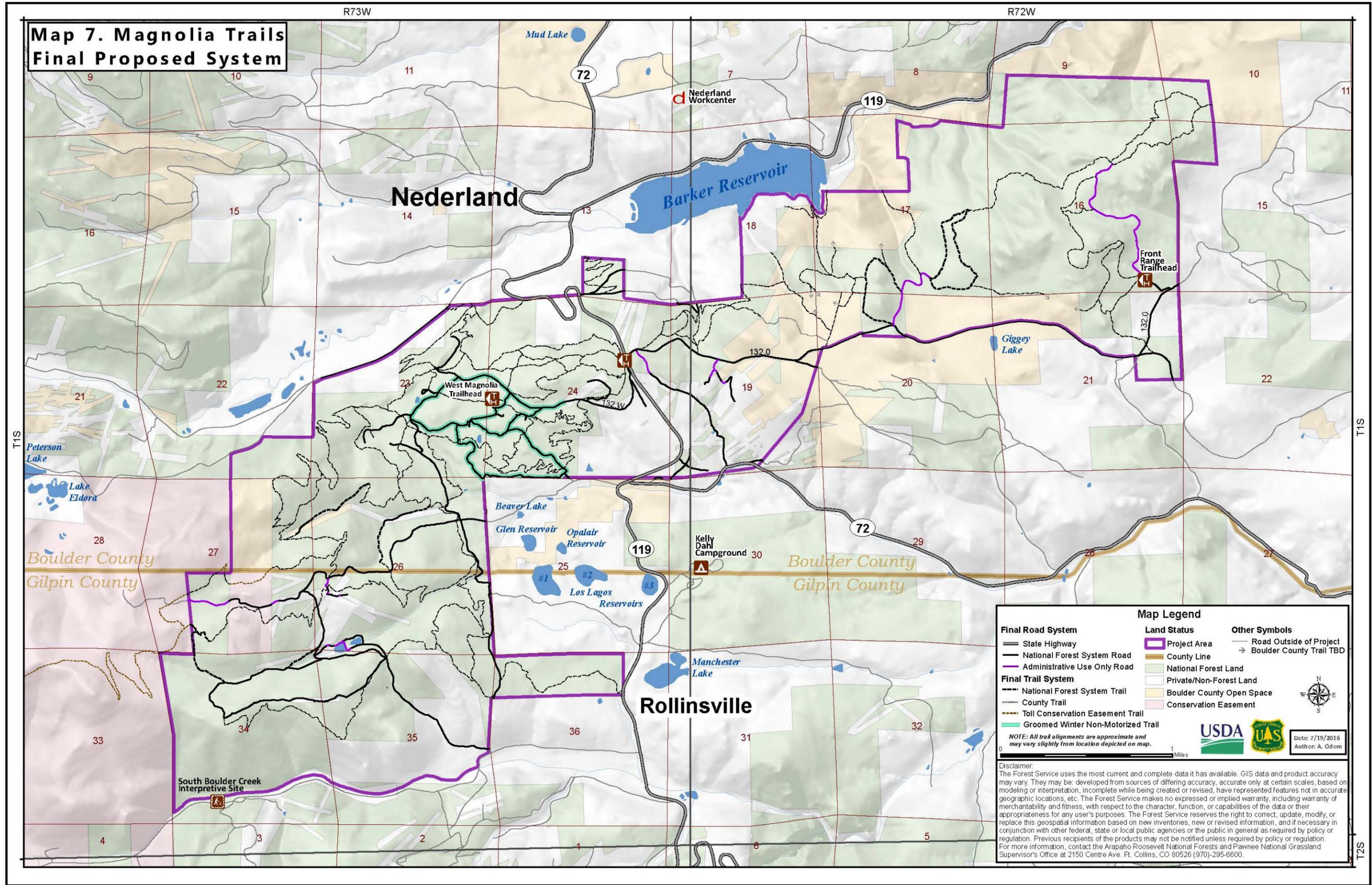
Map Legend

Proposed Action Trails - - - Existing System Trail (may need realignment) - - - Existing County Trail - - - Existing System Trail on Non FS Land - - - New Trail Construction - - - Social Trail - Convert to System Trail - - - Decommission and Obliterate - - - Identified Social Trail to be Obliterated - - - Proposed Toll Conservation Easement Trail - - - Groomed Winter Non-Motorized Trail NOTE: All trail alignments are approximate and may vary slightly from location depicted on map.	Proposed Action Roads - - - Existing System Road (may need realignment) - - - Convert to System Trail and Realign - - - System Road for Administrative Use Only - - - Decommission and Obliterate Other Roads - - - Road Outside of Project - - - State Highway Other Symbols - - - Boulder County Trail TBD	Land and Ownership - - - Project Area - - - County Line - - - National Forest Land - - - Private/Non-Forest Land - - - Boulder County Open Space - - - Conservation Easement
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0 0.25 0.5 0.75 1 Miles 1:32,500
 USDA U.S. Department of Agriculture
 Date: 7/19/2016
 Author: A.O.

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**Map 7. Magnolia Trails
Final Proposed System**



Map Legend

Final Road System	Land Status	Other Symbols
— State Highway	Project Area	— Road Outside of Project
— National Forest System Road	County Line	→ Boulder County Trail TBD
— Administrative Use Only Road	National Forest Land	
Final Trail System	Private/Non-Forest Land	
— National Forest System Trail	Boulder County Open Space	
— County Trail	Conservation Easement	
— Toll Conservation Easement Trail		
— Groomed Winter Non-Motorized Trail		

NOTE: All trail alignments are approximate and may vary slightly from location depicted on map.

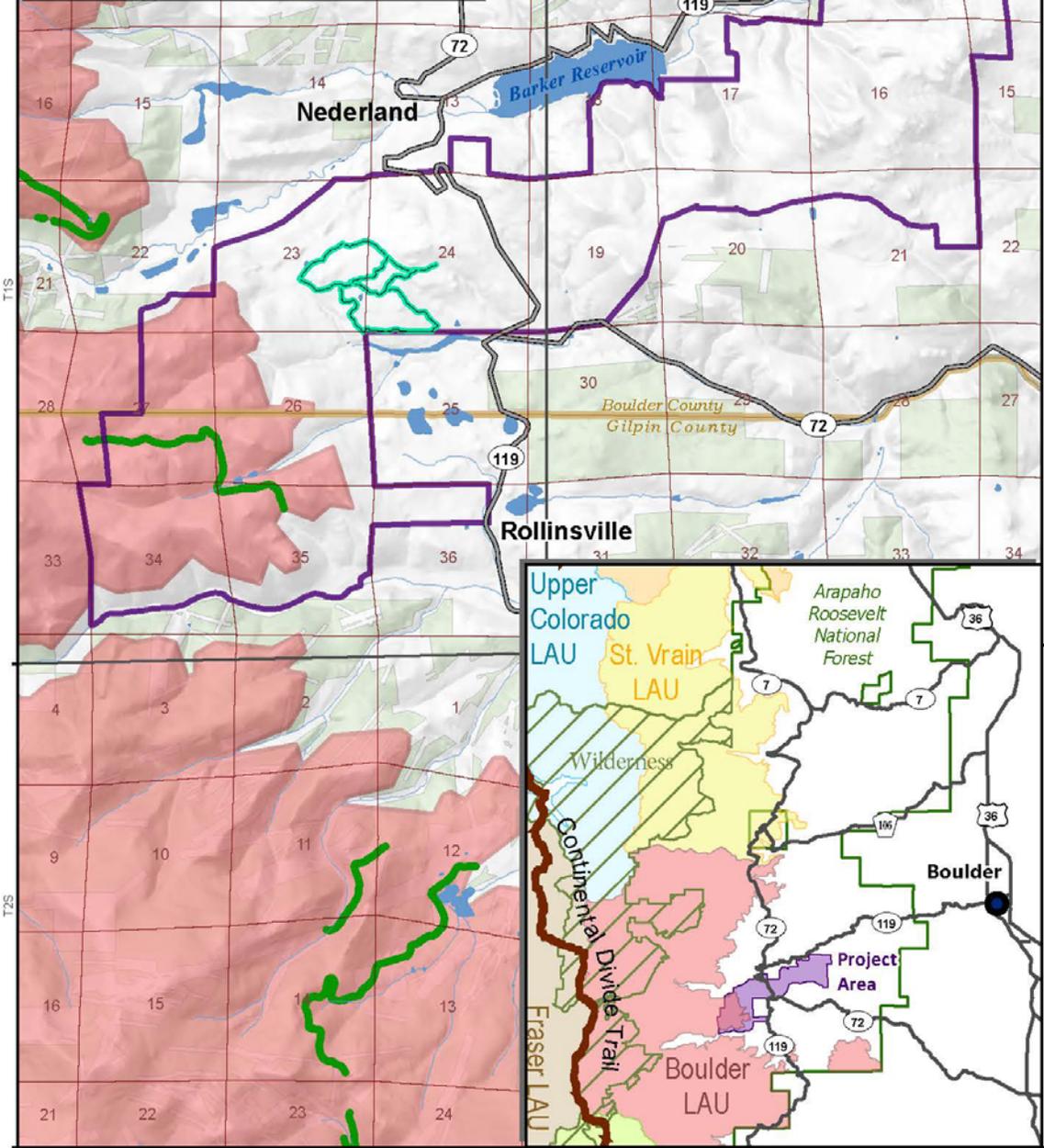
0 1 Miles

USDA U.S. Department of Agriculture

Date: 7/19/2016
Author: A. Odum

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Map 8. Magnolia Trails Lynx Analysis Unit (LAU)



Map Legend

- Boulder LAU
- Lynx Snow Compaction
- Project Area
- National Forest Land
- Proposed Groomed Winter Trail
- County Line

0 1 Miles

Date: 6/24/2016
Author: A. Odom



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APPENDIX B - PROPOSED ACTION FOR EACH TRAIL AND ROAD

Trail Number *	Current Trail Status	Proposed Action
342.1	Open System Trail	No Action****
342.1A	Open System Trail	No Action
342.1B	Open System Trail	No Action
355.1A	Open System Trail	No Action
355.1I	Open System Trail	No Action
357.2A	Open System Trail	No Action
357.2B	Open System Trail	Decommission and Obliterate
357.2B	Open System Trail	No Action
357.2C	Open System Trail	Decommission and Obliterate
357.2C	Open System Trail	No Action
853	Open System Trail	Decommission and Obliterate
853	Open System Trail	No Action
853.1A	Open System Trail	No Action
853.1B	Open System Trail	No Action
853.1B NEW	No Trail	Removed from Proposal
853.1C	Open System Trail	No Action
853.1D	Open System Trail	No Action
853.1E	Open System Trail	Decommission and Obliterate
925.1	Open System Trail	No Action
925.1	Open System Trail	Decommission and Obliterate
925.1	Open System Trail	No Action
925.1A	Open System Trail	Decommission and Obliterate
925.1A	Open System Trail	No Action
925.1B	Open System Trail	Decommission and Obliterate
925.1B	Open System Trail	No Action
925.1B	Open System Trail	No Action
925.1E	Open System Trail	No Action
925.1F	Open System Trail	Decommission and Obliterate
925.1F	Open System Trail	No Action
926.1	Open System Trail	No Action
926.1	Open System Trail	Decommission and Obliterate
926.1	Open System Trail	No Action
926.1A	Open System Trail	Decommission and Obliterate
926.1A	Open System Trail	No Action
926.1B	Open System Trail	No Action
926.1B	Open System Trail	Decommission and Obliterate
926.1D	Closed System Trail	No Action
926.1D	Open System Trail	No Action

926.1E	Open System Trail	No Action
926.1F	Open System Trail	No Action
926.1Ga	Open System Trail	No Action
Trail Number *	Current Trail Status	Proposed Action
927.1	Open System Trail	Decommission and Obliterate
927.1	Open System Trail	No Action
927.1A	Open System Trail	Decommission and Obliterate
927.1A	Open System Trail	No Action
928.1A	Open System Trail	No Action
929.1	Open System Trail	No Action
929.1A	Open System Trail	No Action
929.1B	Open System Trail	Decommission and Obliterate
NEW 1	No Trail	New Trail Construction
NEW 1	No Trail	Removed from Proposal
Social 41***	Non System Trail	Convert to System Trail
Social 36	Non System Trail	Removed from Proposal
Social 34	Non System Trail	Convert to System Trail
NEW 3	No Trail	New Trail Construction
NEW 4	No Trail	New Trail Construction
NEW 5	No Trail	New Trail Construction
Social 27	Non System Trail	Convert to System Trail
Social 33	Non System Trail	Convert to System Trail
NEW 7	No Trail	New Trail Construction
NEW 8	No Trail	Removed from Proposal
NEW 9	No Trail	New Trail Construction
NEW 10	No Trail	New Trail Construction
Social 30	Non System Trail	Convert to System Trail
Social 31	Non System Trail	Removed from Proposal
Social 32	Non System Trail	Convert to System Trail
NEW 14	No Trail	Removed from Proposal
Social 5	Non System Trail	Convert to System Trail
NEW 15	No Trail	Removed from Proposal
NEW 16	No Trail	New Trail Construction
Social 25	Non System Trail	Convert to System Trail
NEW 17	No Trail	New Trail Construction
NEW 17	No Trail	New Trail Construction
NEW 31	No Trail	New Trail Construction
Social 26	Non System Trail	Convert to System Trail
Social 29	Non System Trail	Removed from Proposal
Social 26	Non System Trail	Convert to System Trail
Social 12	Non System Trail	Convert to System Trail
Social 10	Non System Trail	Convert to System Trail
Social 28	Non System Trail	Convert to System Trail
NEW 22	No Trail	Removed from Proposal
Social 10	Non System Trail	Convert to System Trail
NEW 22	No Trail	Removed from Proposal
Social 11	Non System Trail	Convert to System Trail

NEW 23	No Trail	New Trail Construction
Social 12	Non System Trail	Convert to System Trail
Social 2	Non System Trail	Convert to System Trail
Trail Number *	Current Trail Status	Proposed Action
Social 3	Non System Trail	Removed from Proposal
Social 4	Non System Trail	Convert to System Trail
Social 5	Non System Trail	Convert to System Trail
Social 6	Non System Trail	Convert to System Trail
County Trail	Open County Trail	Existing County Trail
Social 7	Non System Trail	Convert to System Trail
Social 8	Non System Trail	Convert to System Trail
Social 9	Non System Trail	Convert to System Trail
RBRD_606.1D	Open System Trail	No Action
RBRD_606.1E	Open System Trail	No Action
RBRD_606.1E	Open System Trail	No Action
606.1D	Open System Trail	No Action
929.1	Open System Trail	No Action
NEW 1	No Trail	New Trail Construction
NEW 3	No Trail	New Trail Construction
NEW 24	No Trail	New Trail Construction
NEW 25	No Trail	New Trail Construction
NEW 29 - TOLL TRAIL	No Trail	New Trail Construction
NEW 30 - TOLL TRAIL	No Trail	New Trail Construction
NEW 32	No Trail	New Trail Construction
NEW 33	No Trail	New Trail Construction
NEW 34	No Trail	New Trail Construction
NEW 35	No Trail	New Trail Construction
NEW 36	No Trail	New Trail Construction
NEW 37	No Trail	New Trail Construction
Social 14	Non System Trail	Convert to System Trail
Social 15	Non System Trail	Convert to System Trail
Social 16	Non System Trail	Convert to System Trail
Social 18	Non System Trail	Convert to System Trail
Social 19	Non System Trail	Convert to System Trail
Social 20	Non System Trail	Convert to System Trail
Social 21	Non System Trail	Convert to System Trail
Social 22	Non System Trail	Convert to System Trail
Social 23	Non System Trail	Convert to System Trail
Social 36	Non System Trail	Convert to System Trail
Social 37	Non System Trail	Convert to System Trail
Social 38	Non System Trail	Convert to System Trail
Social 39	Non System Trail	Convert to System Trail
Social 40	Non System Trail	Convert to System Trail
Social 42***	Non System Trail	Convert to System Trail
Social 43***	Non System Trail	Convert to System Trail
TOLL TRAIL	No Trail	New Trail Construction

*Multiple rows with the same trail number indicate segments of the same trail with differing actions.

***Segments mistakenly identified with duplicate trail numbers during the comment period.

****No Action for any system trail indicates it will remain a system trail, however, it may need realignment or other improvement work to make it a sustainable trail under Forest Service trail standards.

Road Number *	Current Road Status	Proposed Action
105.1	Open 4x4 Road	No Action
105.2A	Open 4x4 Road	No Action
105.2B	Open 4x4 Road	Decommission and Obliterate
119	Open Road	No Action
130	Open Road	No Action
132	Open Road	No Action
132.W	Open Road	No Action
136N.0	Open Road	No Action
343.1	Open Road for Administrative Use Only	No Action
345.1	Private	No Action
345.1	Open 4x4 Road	Open for Administrative Use Only
346.1	Decommissioned Road	No Action
346.1	Open Road	No Action
346.1	Private	No Action
346.1A	Open Road	No Action
346.1A	Private	No Action
350.1	Closed Road	Decommission and Obliterate
352.1	Closed Road	No Action
355.1	Open 4x4 Road	No Action
355.1	Open 4x4 Road	No Action
355.1A	Open 4x4 Road	No Action
355.1B	Open Road for Administrative Use Only	No Action
355.1C	Open 4x4 Road	No Action
355.1D	Open 4x4 Road	No Action
355.1E	Open 4x4 Road	No Action
355.1G	Decommissioned Road	No Action
355.1G	Open 4x4 Road	No Action
355.1H	Open for Administrative Use Only	Convert to Trail and Realign
355.1H	Open for Administrative Use Only	Decommission and Obliterate
355.1I	Decommissioned Road	Convert to Trail and Realign
355.1I	Decommissioned Road	No Action
355.1I	Decommissioned Road	Convert to Trail and Realign
355.1I	Decommissioned Road	No Action
355.1J	Decommissioned Road	No Action
355.1K	Open 4x4 Road	No Action
355.1L	Decommissioned Road	No Action
355.1M	Decommissioned Road	No Action
355.1N	Decommissioned Road	No Action
355.1P	Decommissioned Road	No Action
355.1Q	Decommissioned Road	No Action
355.1R	Decommissioned Road	No Action
355.1S	Decommissioned Road	No Action

355.1U	Decommissioned Road	No Action
355.1U	Open 4x4 Road	No Action
355.1V	Open 4x4 Road	No Action
Road Number *	Current Road Status	Proposed Action
355.1W	Decommissioned Road	No Action
355.1X	Decommissioned Road	No Action
355.1Y	Decommissioned Road	No Action
355.1Z	Decommissioned Road	No Action
355.S10	Decommissioned Road	No Action
355.S11	Open 4x4 Road	Decommission and Obliterate
355.S14	Open 4x4 Road	No Action
355.S15	Open 4x4 Road	No Action
355.S18	Open 4x4 Road	No Action
356.1	Private	No Action
356.1B	Private	No Action
357.1	Open 4x4 Road	No Action
357.1	Closed Road	Open for Administrative Use Only
358.1	Open 4x4 Road	Open for Administrative Use Only
358.1	Private	Open for Administrative Use Only
358.1A	Open 4x4 Road	Open for Administrative Use Only
358.1A	Private	Open for Administrative Use Only
3W72.0	Undetermined	No Action
4W72.0	Undetermined	No Action
552	Open Road	No Action
606.1	Closed Road	Open for Administrative Use Only
606.1A	Closed Road	Convert to Trail and Realign
606.1B	Closed Road	Convert to Trail and Realign
606.1C	Open 4x4 Road	Convert to Trail and Realign
72	Open Road	No Action
958	Open Road	No Action
97E.0	Open Road	No Action
105.1	Open 4x4 Road	No Action
105.1	Open Road	No Action
105.1A	Open 4x4 Road	No Action
105.1A	Open 4x4 Road	Open for Administrative Use Only
105.1B	Open 4x4 Road	No Action
105.1B	Open 4x4 Road	Open for Administrative Use Only
105.1B	Private	No Action
105.1C	Open 4x4 Road	Open for Administrative Use Only
105.1C	Private	No Action
105.2A	Open 4x4 Road	No Action
109.1	Open 4x4 Road	Convert to Trail and Realign
109.1	Open 4x4 Road	No Action
109.1A	Open 4x4 Road	Convert to Trail and Realign
109.1A	Private	Convert to Trail and Realign
109.1B	Open 4x4 Road	No Action

109.1C	Open 4x4 Road	Convert to Trail and Realign
109.1C	Open 4x4 Road	Decommission and Obliterate
429.1	Open 4x4 Road	No Action
Road Number *	Current Road Status	Proposed Action
503.1	Open 4x4 Road	No Action
503.1	Open 4x4 Road	Open for Administrative Use Only
503.1	Private	No Action
512.1	Open 4x4 Road	Decommission and Obliterate
512.1	Open 4x4 Road	No Action
512.1A	Open 4x4 Road	Decommission and Obliterate

* Multiple rows with the same road number indicate segments of the same road with differing actions.

APPENDIX C - COMMENT RESPONSE

<p>Many private landowners were concerned with location of trails near their property or crossing their property; potentially increasing trespass, and conflicts between recreationists and private landowners (e.g. such as proposed trails crossing permitted private home driveways). Landowners were also concerned about increased traffic on local roads, and parking along roads where sanitation facilities don't exist. Some are concerned about the development of restrooms and trailhead facilities, as they will increase traffic and visitation (i.e., Front Range Trailhead). Some suggested the trail system connection to the town of Nederland would lessen the impact to rural residents where trail head facilities exist or are proposed.</p>	<p>In the iterative process for refining Alternative B - Proposed Action, the Forest Service made adjustments where possible to address neighboring landowners and their concerns about trespass, sanitation facilities and increased traffic. We included Social 4 into the Proposed Action to provide another connection (Social 2 also provides a connection) to the town of Nederland, which could reduce some traffic and sanitation concerns on the National Forest lands near private landowners as well as supporting the local economy. Additionally, expanding trailhead facilities addresses sanitation issues and recognizes the recreation existing and expected increasing use. Some trails have historically crossed private lands and the Forest Service will work towards obtaining legal public access.</p>
<p>Many are concerned about the FS budgets levels and proposing a new trails system. Currently, the FS doesn't patrol and maintain the existing trail system; the Forest Service lacks the capacity to manage trails system nor enforce regulations. The Forest Service has allowed social trails to proliferate through lack of enforcement. People are concerned about how NFSs lands are managed as a whole, and that adding this project will add to that burden.</p> <p>People were concerned about how we are going to fund the project, yet many people are wanting to volunteer to implement this project by offering to build these trails.</p>	<p>Forest Service budgets can be variable from year to year, which is why the Forest Service pursues partnership support. Partners develop ownership when they work on a trail and we expect more compliance from our partners.</p> <p>Concern over the proposed action to improve the current non-motorized trail system suggested that it would not improve the Forest Service's ability to manage the trails and enforce regulations in the area as a lack of funding and personnel exacerbate this issue.</p> <p>The proposed action, however, does improve the Forest Service's ability to manage the trails and enforce regulations in the area, while also reducing the unmanaged recreational use currently happening on social trails, by providing additional trail mileage, addressing unsustainable segments of existing system trails, and increasing the navigability of trails within the project area. Additionally, implementation of system trails with a</p>

	<p>sustainable design strategy reduces the maintenance intervals needed to maintain the system and increases the overall quality of the trail alignments. Partner organizations motivated by the new opportunities have expressed interest in supporting the management of the area with both funding and public educational efforts. The significant engagement by local partnership groups and volunteers to implement the proposed action has been recognized throughout the planning process and is anticipated to remain significant throughout any approved implementation activities. These partnership groups and volunteers will supplement Forest Service presence along with the additional County law enforcement support currently in place. Additionally, partner groups will follow a Forest Service developed protocol for reporting maintenance and enforcement needs. Project survey results showed a majority of respondents had participated in volunteer activities throughout the county within the past year.</p>
<p>People are concerned with transient population, escaped camp fires, trash, human waste, and recreational shooting in the area. These issues should be addressed in this project.</p>	<p>These issues are concerns of the Forest Service and other local governments, but these issues are being addressed through other efforts with multiple constituencies.</p>
<p>People are concerned about past Forest Service fuel projects, and that their recreation experience was changed. Some were concerned that slash piles from the fuel treatment increased fire hazard in the area.</p>	<p>Vegetation treatments to reduce the risk of wildfire in the urban-wildland interface of portions of the Magnolia Project Area are a priority for both the Forest Service and local communities and private landowners living within the boundaries of the Roosevelt National Forest. Short term effects from fuels projects have changed the recreation experience/setting. However, the Forest Service has planted trees, adjusted locations of trails (providing a different experience) and dispersed campsites and burned slash piles. Over the longer term, the recreational experience will provide new opportunities and scenic views.</p>
<p>Elk Migration and habitat connectors provide transition range and cover for elk and other wide ranging mammals as they move seasonally between the montane parklands</p>	<p>See Chapter 3, Wildlife section</p>

of Tolland and Arapahoe Ranch and the lower elevation of Winiger Ridge using the Magnolia Road corridor.	
<i>Forest Plan</i> direction is violated for Habitat Effectiveness and Fragmentation	See Chapter 3, Wildlife section
Some commenters requested additional public involvement. Suggestions were made that the Forest Service relied more heavily on information provided by certain special interests from the Boulder community and private contractor and didn't include other special interests from the residents of Nederland for their input and concerns.	The Forest Service began involving the public in 2012. The Forest Service held two comment periods and received over 600 comment letters with well over 1000 comments. These commenters lived in Nederland, Rollinsville, other mountain communities, Boulder, and other Front Range Cities. No one community or recreation user type was favored for this non-motorized trail system proposal.
The Forest Service should do an EIS to disclose the impacts of this project.	The purpose of an Environmental Assessment (EA) is to determine if any significant effects are identified that require an Environmental Impact Statement (EIS). The Responsible Official has reviewed the Finding of No Significant Impact (FONSI) and determined that an EIS is not necessary. (See Chapter 5, this EA)
Social 4 was included in the 2013 Proposed Action, but was dropped from the 2015 Proposed Action. Many comments were received about benefits of connectivity of this trail to the Town of Nederland. Comments were received suggesting that the Forest Service proposed project encourage users to start/finish in the town of Nederland, that this could support the local economy.	The Forest Service agrees and has included Social 4 back into Alternative B-Proposed Action for connection into the East Magnolia Zone. Social 2 is included for adoption to the trail system for connection between Nederland and the West Magnolia zone.
Commenters suggested that the Forest Service not do away with social trails connecting Nederland to the trail network, that social trails are key to the Nederland trail experience.	Some social trails have been included in the Proposed Action that do connect to Nederland. However, social trails by their nature develop over time without approval or acceptance by the Forest Service. These unauthorized trails have negative effects on other resources such as wildlife, soil, and water which necessitates removing many of these unauthorized trails from the land.
Comments expressed concern about the regulation to restrict mountain bikers and horseback riders to designated trails.	Historically, areas of National Forest did not have high recreation use. But once recreation use expands to a point where social trails are created and other resource impacts occur, then the Forest Service finds it necessary to put in place regulations. It should be noted that there are many areas on NFS lands that do not restrict cross-country travel.

<p>The Forest Service received many very specific trail comments: which trails to include; which trails to eliminate; which trails should be moved.</p>	<p>The Forest Service reviewed all these suggestions in its iterative development of the proposed action. Not all suggestions could be included, but many were included.</p>
<p>Commenters wanted more regional trail connections, northwest across Eldora Mountain Resort to Eldora Townsite, Hessie and beyond; north to Caribou Townsite, Caribou Ranch, the Switzerland Trail; east to Walker Ranch and southeast to Winiger Ridge, and to Mt. Thorodin; and wanted trail connections across Boulder County owned lands.</p>	<p>When Boulder County acquired an easement for a trail across private land to the south and west of the Magnolia Trails Project area, the Forest Service expanded the project area to provide a connection to the Toll Conservation Easement Trail. In the East Magnolia Zone, other connections will be developed as Boulder County finalized its trail system in the Reynolds Ranch area. No other connections are planned at this time.</p>
<p>Some questioned the Forest Service mapping of trails, especially social trails; missing social trails, including a social trail that did not exist on the ground or not depicting the trail accurately showing its meandering nature.</p>	<p>With 6000 acres within the project area, the Forest Service captured the existing social trails that were in place at the time of its mapping efforts. The final adopted system will be GPS-located.</p>
<p>Many were supportive of a Nordic groomed trails system during the winter, but others suggested allowing fat tire bikes in the winter.</p>	<p>Alternative B- Proposed Action now includes fat tire bikes on the winter groomed non-motorized trail.</p>
<p>People are concerned about how the trails will be constructed (by hand, machine, how wide they be, will they be "natural" looking, loss of challenge, will they change the character of the area/experience, signage, etc). They were unclear about the 2-3 feet wide trails and 400 foot trail corridor.</p>	<p>Regardless of how the trail would be constructed, the objective of the trail system is to maintain the natural character of the existing system within Forest Service design standards. The width of the trail system has been clarified in Alternative B.</p>
<p>Some question the need for signing, believing that signs will pollute the visuals of the system and change the user experience. Some stated that mapping software would provide the necessary navigation tools.</p>	<p>Signing is necessary for safety of the recreation user and for resource protection and will be done to the minimum necessary. Not all users of the trail system will have software for their navigation needs.</p>
<p>Some stated that this project was mountain bike-centric excluding other non-motorized uses such as equestrian.</p>	<p>The intent of the proposed action is to maintain multi-use access across all trails, while some trails within the project area may be optimized for specific user groups.</p>
<p>Concerns have been raised that this proposed action is not following the 1997 Revised <i>Forest Plan</i>, citing p.70, Figure 2.7; James Creek Geographic Area.</p>	<p>The Magnolia Trails project area does not include the James Creek Geographic Area that this comment is referencing.</p>
<p>Motorized users are concerned that we are eliminating motorized use in the project area and at different locations (Lefthand Canyon and Rollins Pass) on the Boulder Ranger District managed lands. Concerns has been raised that there are no routes identified for multiple [motorized] use. The Forest Service has "chosen to exclude the public for</p>	<p>The existing trail system is currently for non-motorized use only, therefore the proposed trail system is not eliminating motorized use. The proposed action maintains the motorized recreation opportunity in the project area. The actions proposed on the road system were very</p>

<p>the benefit of a small user group". Concerns were raised that Boulder County Open Space stresses non-motorized recreation and that the US Forest Service must strive to maintain multiple use [motorized] opportunities on adjacent lands.</p>	<p>small road segments that either were not used heavily, were redundant with other roads or went for short-distances and dead-ended at private land with private land access denied. Approximately 3 miles of roads open to the public were removed from the road system in the project area. Within the Boulder Ranger District there are 205 miles of roads (many very primitive) that provide motorized recreation opportunities.</p>
<p>Concerns have been raised about eliminating Over Snow Vehicle [OSV] use over the entire project area. Yet the commenter stated that they "are aware that the Magnolia area is not a destination location of OSV travel in Colorado due [to] its lower altitude and limited snowfall." The commenter stated that the proposed action conflicts with the winter travel management standards and decision in the 1997 <i>Forest Plan</i>. The commenter stated that there is an imbalance of winter recreation opportunities, non-motorized vs motorized.</p>	<p>The Forest Service agrees that there is limited opportunity for OSV use due to lower elevation and limited snowfall. At the higher elevations, lynx, a threatened species under the Endangered Species Act, restricts OSV due to snow compaction in its habitat.</p>
<p>Concerns were raised that the proposed trail actions should only be implemented concurrently with funding for trail development so as not to impact trail maintenance and management. It was suggested that funding mechanisms be included in the adaptive management component of the Proposed Action.</p>	<p>It is the intention of the Forest Service to utilize its own funding sources as well as other funding sources to both construct and maintain the trail system. Volunteers will also serve an important role to assist in management and monitoring of the trails. The Forest Service does not feel that funding needs to be included in the adaptive management component of the Proposed Action.</p>

APPENDIX D - REFERENCES

- Appalachian Mountain Club. *AMC's Complete Guide to Trail Building and Maintenance*. 2008
272 pp.
- Beisel, J. N., P. Usseglio-Polatera, and J. C. Moreteau. 2000. The spatial heterogeneity of a river bottom: a key factor determining macroinvertebrate communities. *Hydrobiologia* 422/423: 163-171.
- Belcher, C. 2015. *Estimating the Population Size and Distribution of the Arapahoe Snowfly (Arsapnia arapahoe) (Plecoptera: capniidae) along the norther Front Range of Colorado*. Colorado State University, Fort Collins, CO.
- Bjornn, T. C., M. A. Brusven, M.P. Molnau, J. H. Milligan, R. A. Klamt, E. Chacho, and C. Schaye. 1977. *Transport of Granitic Sediment in Streams And its Effects on Insects and Fish*. University of Idaho, Forest, Wildlife and Range Experiment Station Bulletin 17, Moscow, ID.
- Bjronn, T. C. and D. W. Reiser. 1991. *Habitat Requirements of Salmonids in Streams*. American Fisheries Society Special Publication 19: 83-138.
- Cardindale, B. J., M. A. Palmer, C. M. Swan, S. Brooks, and N. L. Poff. 2002. *The Influence of Substrate Heterogeneity on Biofilm Metabolism in a Stream Ecosystem*. *Ecology* 83: 412-422.
- Central Oregon Trail Alliance (International Mountain Biking Association (IMBA) affiliated non-profit organization). 2011. *Draft Trail Standard*.
- Colorado Parks and Wildlife, 2005. *Elk Management Plan: Data Analysis Unit E-38: Clear Creek Herd*. Prepared by Sherri Huwer for Colorado Parks and Wildlife October 31, 2002. Approved by the Colorado Wildlife Commission March 8, 2006. Available: http://cpw.state.co.us/Documents/Hunting/BigGame/DAU/Elk/E38DAUPlan_ClearCreek.pdf
- ContourLogic, LCC. 2014. *Proposed West Magnolia Trail System Master Plan*.
- Erman, D. C., and N. A. Erman. 1984. *The Response Of Stream Macroinvertebrates To Substrate Size And Heterogeneity*. *Hydrobiologia* 108: 75-82.
- Francis, C. D., C. P. Ortega, and A. Cruz. 2009. *Noise Pollution Changes Avian Communities and Species Interactions*. *Current Biology* 19, pp. 1415–1419.
- Hallock, D. 1991. *Lake Eldora Ski Area Elk Study*. January 1991. 37pp.
- Heinold, B.D., Gill, B.A., Belcher, T.P., & Verdone, C.J. 2014 *Discovery of New Populations Of Arapahoe Snowfly Arsapnia Arapahoe (Plecoptera: Capniidae)*. *Zootaxa*, 3866, pp. 131-

- Jordan, M. 2000. *Ecological Impacts of Recreational Use of Trails: A Literature Review*. The Nature Conservancy, Cold Spring Harbor, New York.
- Joslin, G. and H. Youmans, 1999. *Effects of Recreation on Rocky Mountain Wildlife: A Review for Montana*. Committee on Effects of Recreation on Wildlife. Montana Chapter of the Wildlife Society. 307pp.
- Kaller, M. D., and K. J. Hartman. 2004. *Evidence of a Threshold Level of Fine Sediment Accumulation for Altering Benthic Macroinvertebrate Communities*. *Hydrobiologia* 518: 95-104.
- Knight, Richard L. And K. J. Gutzwiller. 1995. *Wildlife and Recreationists: Coexistence through Management and Research*. Island Press, Washington, DC. 372pp.
- Packauskas, R.J. (2005, August 24). *Hudsonian Emerald Dragonfly (Somatochlora hudsonica): a Technical Conservation Assessment*. [Online]. USDA Forest Service, Rocky Mountain Region. <http://www.fs.fed.us/r2/projects/scp/assessments/hudsonianemeralddragonfly.pdf> 2/4/2016
- Preisler, H. K., A. A. Ager, and M. J. Wisdom. 2013. *Analyzing Animal Movement Patterns Using Potential Functions*. *Ecosphere* 4: UNSP 32.
- Richards, C., and K. L. Bacon. 1994. *Influence of Fine Sediment On Macroinvertebrate Colonization On Surface and Hyporheic Stream Substrates*. *Great Basin Naturalist* 54: 106-113.
- Rowland, M.M., M.J. Wisdom, B.K. Johnson, and M.A. Penninger. 2005. *Effects of Roads on Elk: Implications for Management in Forested Ecosystems*. Pgs. 42-52 in Wisdom, M.J., tech. ed., *The Starkey Project: A Synthesis of Long Term Studies of Elk and Mule Deer*. 2004 Trans. of the No. American Wildlife and Natural Resources Conf., Alliance Communications Group, Lawrence, Kansas, US
- Student Conservation Association. 2006. *Lightly on the Land: The SCA Trail Building and Maintenance Manual, Second Edition*.
- Taylor, A. R and R. L. Knight. 2003. *Wildlife Responses to Recreation and Associated Visitor Perceptions*. *Ecological Applications*, 13(4) pp. 951-963.
- Trails and Wildlife Task Force, Colorado State Parks, and Hellmund Associates. 1998. *Planning Trails with Wildlife in Mind: A Handbook for Trail Planners*. Available online at <http://cpw.state.co.us/Documents/Trails/TrailsPlanningPrimer.pdf> 51 pp.
- Tombulak, S. C. and C. A. Frissell. 2000. *Review of Ecological Effects of Roads on Terrestrial and Aquatic Communities*. *Conservation Biology*: V. 14, No 1. p. 18.
- International Mountain Bicycling Association. 2004. *Trail Solutions: IMBA's Guide to Building*

Sweet Singletrack. 272 pp.

University of Wyoming. 2014. *Iterative NEPA and Collaboration: Proceedings of the iNEPA Workshop February 10 and 11, 2014*, Salt Lake City, Utah, p.13

US Government Printing Office. 2015. *36 Code of Federal Regulation 220.7(b)(2)(iii). NEPA Implementation Regulations*.

US Government Printing Office. 2015. *40 Code of Federal Regulations 1508.7*, Council on Environmental Quality

USDA Forest Service, Arapaho and Roosevelt National Forests and Pawnee National Grassland. *Caribou-West Magnolia Environmental Assessment*. 2003.

USDA Forest Service, Arapaho and Roosevelt National Forests and Pawnee National Grassland. *Lump Gulch Fuels Treatment Environmental Assessment*. 2009.

USDA Forest Service, Arapaho and Roosevelt National Forests and Pawnee National Grassland. *Forsythe I Fuels Treatment Environmental Assessment*. 2013.

USDA Forest Service, Arapaho and Roosevelt National Forests and Pawnee National Grassland. 2003. *Noxious Weed Management Plan*.

USDA Forest Service, Deschutes National Forest: *Mountain Bike Trail Standard: Tiered to FSH 2309.18 23.13 Bicycle Design Parameters* (2015)

USDA Forest Service, Nez Perce National Forest. 2007. *Trail Construction and Maintenance Notebook* (0723-2806-MTDC)
<http://www.fs.fed.us/t-d/pubs/htmlpubs/htm07232806/page02.htm>

USDA Forest Service. *Bridges and Structures* (FSM 7722 and FSM 7736)

USDA Forest Service 2001. *Draft – Soil and Terrestrial Ecological Land Unit Survey, Arapaho and Roosevelt National Forests*, Colorado.

USDA Forest Service Handbook - *Soil Management 2509.18, Region 2 Supplement*, August 15, 1992.

USDA Forest Service Handbook - *Watershed Conservation Practices Handbook 2509.25, Region 2 Supplement*, August 15, 1992.

USDA Forest Service. *Health and Safety Code Handbook* (FSH 6709.11)

USDA Forest Service. 2012. *National Best Management Practices for Water Quality Management on National Forest System Lands*, Volume 1: National Core BMP Technical Guide. FS-990a.

USDA Forest Service, *National Forest System NEPA Handbook* 1909.15, 42.22.

USDA Forest Service. 1997. 1997 Revision of the Land and Resource Management Plan, including appendices, Record of Decision, Final Environmental Impact Statement and appendices, errata, and other associated documents. Arapaho and Roosevelt National Forests and Pawnee National Grassland, Supervisor's Office, Fort Collins, Colorado. [Online]. Available: http://www.fs.usda.gov/detail/arp/landmanagement/planning/?cid=fsm91_058277

USDA Forest Service. *Sign and Poster Guidelines* (EM-7100-15)

USDA Forest Service. *Standard Specifications for Construction and Maintenance of Trails* (EM-7720-103)

USDA Forest Service. Standard Trail Plans and Specifications webpage
<http://www.fs.fed.us/recreation/programs/trail-management/trailplans/index.shtml>

USDA Forest Service. 2008. *Supplemental Biological Assessment of the Southern Rockies Lynx Amendment on Threatened, Endangered and Proposed Species for the following National Forest Land and Resource Management Plan Amendments: Arapaho and Roosevelt National Forests; Grand Mesa, Uncompahgre and Gunnison National Forests; Pike and San Isabel National Forests; Medicine Bow and Routt National Forests; Rio Grande National Forest; San Juan National Forest; White River National Forest.* USDA Forest Service, Rocky Mountain Region.

USDA Forest Service. *Trails Management Handbook* (FSH 2309.18)

USDA Forest Service. *Trails Manual* (FSM 2353)

USDA Forest Service. 1998. Unpublished data for Aquatic Biotic Rating for South Boulder Creek Watershed (HUC-6 10190051006). Arapaho and Roosevelt National Forest and Pawnee National Grassland Land, Boulder Ranger District. USDA Forest Service. 2015. Magnolia Trails project area field visit. Arapaho and Roosevelt National Forest and Pawnee National Grassland Land, Boulder Ranger District.

USDA Forest Service and USDI Bureau of Land Management. 2010. *Final Environmental Impact Statement: Gunnison Basin Federal Lands Travel Management.* April 2010, Delta, CO. [Online]. Available: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5182985.pdf

USDI Fish and Wildlife Service. 2008. *Biological Opinion on the Effects of the Southern Rocky Mountains Lynx Amendment on the Distinct Population Segment (DPS) of Canada lynx (Lynx Canadensis) in the contiguous United States.* Colorado Field Office, Lakewood, Colorado. 85 pp.

Waters, T. F. 1995. *Sediment in Streams: Sources, Biological Effects, and Control.* American Fisheries Society Monograph 7.

Weber, Pete (editor). 2007. *Managing Mountain Biking—IMBA's Guide to Providing Great Riding*. 256 pp.

Wisdom, M.J., N.J. Cimon, B.K. Johnson, E.O. Garton, L.D. Bryant, J.W. Thomas, and J.G. Kie. 2004. *Spatial Partitioning by Mule Deer and Elk in Relation to Traffic*. Trans. of the No. American Wildlife and Natural Resources Conf. 69:509-530

APPENDIX E – RESPONSIBLE OFFICIAL AND INTERDISCIPLINARY TEAM

Responsible Official

Sylvia Clark: District Ranger

Interdisciplinary Team

Karen Roth: Interdisciplinary Team Leader
Reid Armstrong: Public Affairs
Michael Anderson: Recreation and Trails Planner
Beverly Baker: Wildlife Biologist
Tom Bates: Botanist
Amy Coe: GIS Specialist
Chris Carroll: Fisheries Biologist
Carl Chambers: Hydrologist
Matt Henry: Recreation Staff Officer
Ed Perault: Recreation Planner
Karen Roth: Interdisciplinary Team Leader
Abe Thompson: Archeologist
Michelle White: Transportation Engineer
Kevin Zimlinghaus: Silviculturist