

## **CHAPTER 1 - INTRODUCTION**

### **1.1 IDENTIFYING INFORMATION**

CASEFILE/PROJECT NUMBER (optional):

PROJECT TITLE: Vegetation Manipulation Management: Chaffee and Lake County Planning

PLANNING UNIT: Arkansas River #1, Collegiate/Sangre #2

LEGAL DESCRIPTION: Chaffee and Lake County, see attached map

APPLICANT: BLM

### **1.2 INTRODUCTION AND BACKGROUND**

BACKGROUND:

Colorado's forests are disturbance driven; they are dependent upon change for maintenance and renewal. Fires, insect and disease outbreaks, and forest management can add diversity and resiliency to forest stands or bring about entirely new forests from old ones. Historically, fires have occurred naturally throughout the Rocky Mountain West and have played an important ecological role in maintaining the function and pattern of the vegetation on the landscape. Fires have played a role in reducing natural fuel build-ups, along with maintaining forest health and wildlife habitats. During the settlement of the area most of the larger trees were removed for railroad transportation, building infrastructure, and to provide heat. Over time fire suppression and grazing have interrupted the natural frequency and intensity of fires, allowing forests to become populated with smaller trees. Smaller trees are generally less fire resistant and provide a ladder for fire to move into the canopy. A canopy or crown fire is the most destructive and difficult to control.

The high canopy cover and multistoried stand structure found in late stages of succession certainly improves big game thermal and security cover (Gruell 1980). However, the dense canopies also shade out early seral shrubs and grasses that usually have high forage value for many ungulates. Production of palatable shrub forage in old, fire excluded stands may be less than 1 percent of that found in young post-fire communities. Moreover, ungulates may find dense late seral stands difficult to traverse because of the abundance of downed logs and thick understory (Gruell 1979; Lonner and Pac 1990). Carrying capacity for elk can be diminished by removing disturbance from the ecosystem due to reduction in quality browse plant species (Gruell 1979). Furthermore, the lack of disturbance reduces winter range and forage quantity and quality, eventually reducing deer populations (Habeck 1985).

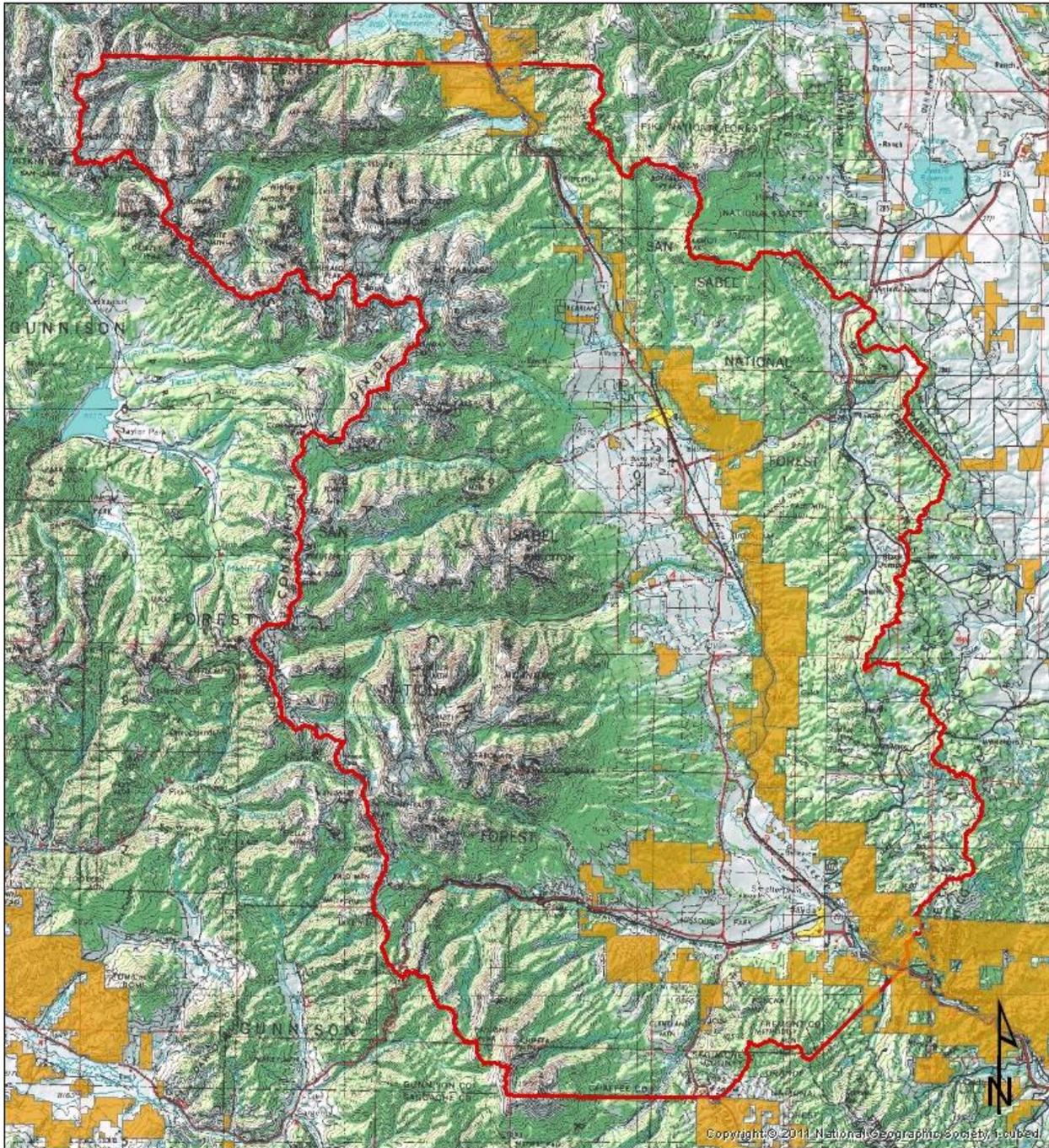
Landscapes with intact fire regimes have high variability in patch size, shape, and type, which is extremely beneficial for the existence of many avian species. This can also be said for many insect and rodent species (Higgins and others 1991). Finch and others (1997) mention that fire exclusion in Southwestern forests tends to favor generalist bird species that can utilize all stages of succession rather than specialist bird species found primarily on heterogeneous landscapes, open forests, burns, snags, or a combination of all. Small mammal populations may increase with the number of down logs as fuels accumulate during succession, but many mice, shrews, and gophers are found mostly in those early seral communities that directly follow fire. Moreover, the diverse mosaic of stand structures and composition created by an intact fire regime greatly correlate with higher numbers of small mammal individuals and species (Ream and Gruell 1980).

Vegetation manipulation projects can reintroduce a disturbance regime mimicking historical disturbances once caused by fire. The results of such actions may lessen the intensities at which a wildfire burns, and give firefighters an improved chance at intercepting and slowing the fire before it reaches private property and/or develops into a catastrophic wildfire, and improve wildlife and range conditions by providing a mosaic of vegetative successional stages. Vegetation manipulation projects are accomplished by forest thinning, clearing, and prescribed burning under ideal conditions; removing combustible materials that increase fire intensity and setting back forest succession. Thinning treatments also reduce the risk of large scale tree mortality from bark beetle epidemics and other forest pests improving the health and resiliency of forests.

This is joint umbrella environmental assessment between Bureau of Land Management-Royal Gorge Field Office (RGFO) and San Isabel National Forest (FS) that will cover a range of vegetation treatment methods within the analysis area while viewing the planning area as a contiguous landscape. The benefit of an umbrella assessment is treatment affects will be analyzed at a landscape level, rather than individual pieces. The Bureau of Land Management-Royal Gorge Field Office completed a similar document titled “Fuels Management - Western Fremont County Fuels Planning” (DOI-CO-200-2005-0021 EA) in 2005. The Western Fremont County document has been a valuable tool for the RGFO resource staff to manage fuels, range, and wildlife projects at a landscape level within that spatial region. Its successfulness is the primary reason to extend this type of programmatic evaluation to additional lands managed by the RGFO.

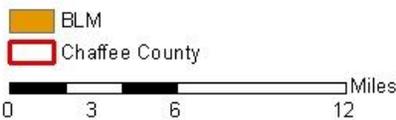
The analysis area is RGFO managed land located within Chaffee County (Figure 1) and Lake County (Figure 2) and FS managed lands located within a two mile buffer of RGFO managed lands within Lake and Chaffee Counties (Figure 3). The Bureau of Land Management-Royal Gorge Field Office manages nearly 150,000 acres of surface lands in Chaffee County and more than 25,000 acres of surface lands in Lake County, Colorado. The analysis area encompasses a variety of vegetation types; however, the dominant classifications include piñon/juniper, mixed conifer forest and ponderosa pine. In regards to RFGO, projects tiered to this document will be designed to thin dense forest stands and create openings to fulfill the objectives of renewable resource programs of the RFGO.

Figure 1. Bureau of Land Management-Royal Gorge Field Office managed land located within Chaffee County, Colorado. 2013.



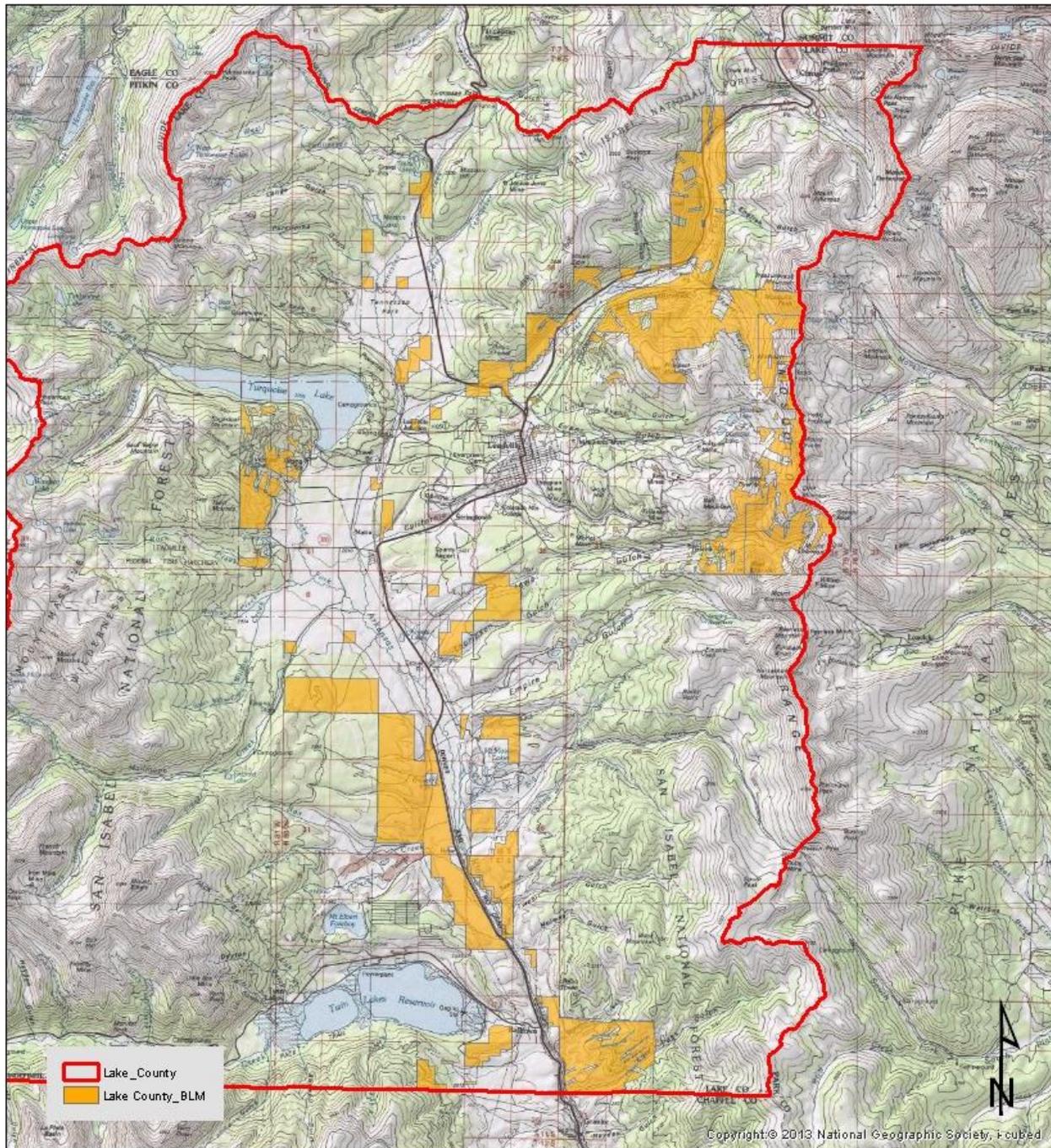
**VEGETATION MANIPULATION PLANNING  
CHAFFEE COUNTY**

DOI-BLM-CO-200-2013-0050



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Figure 2. Bureau of Land Management-Royal Gorge Field Office managed land located within Lake County, Colorado. 2013.



**VEGETATION MANIPULATION PLANNING  
LAKE COUNTY**

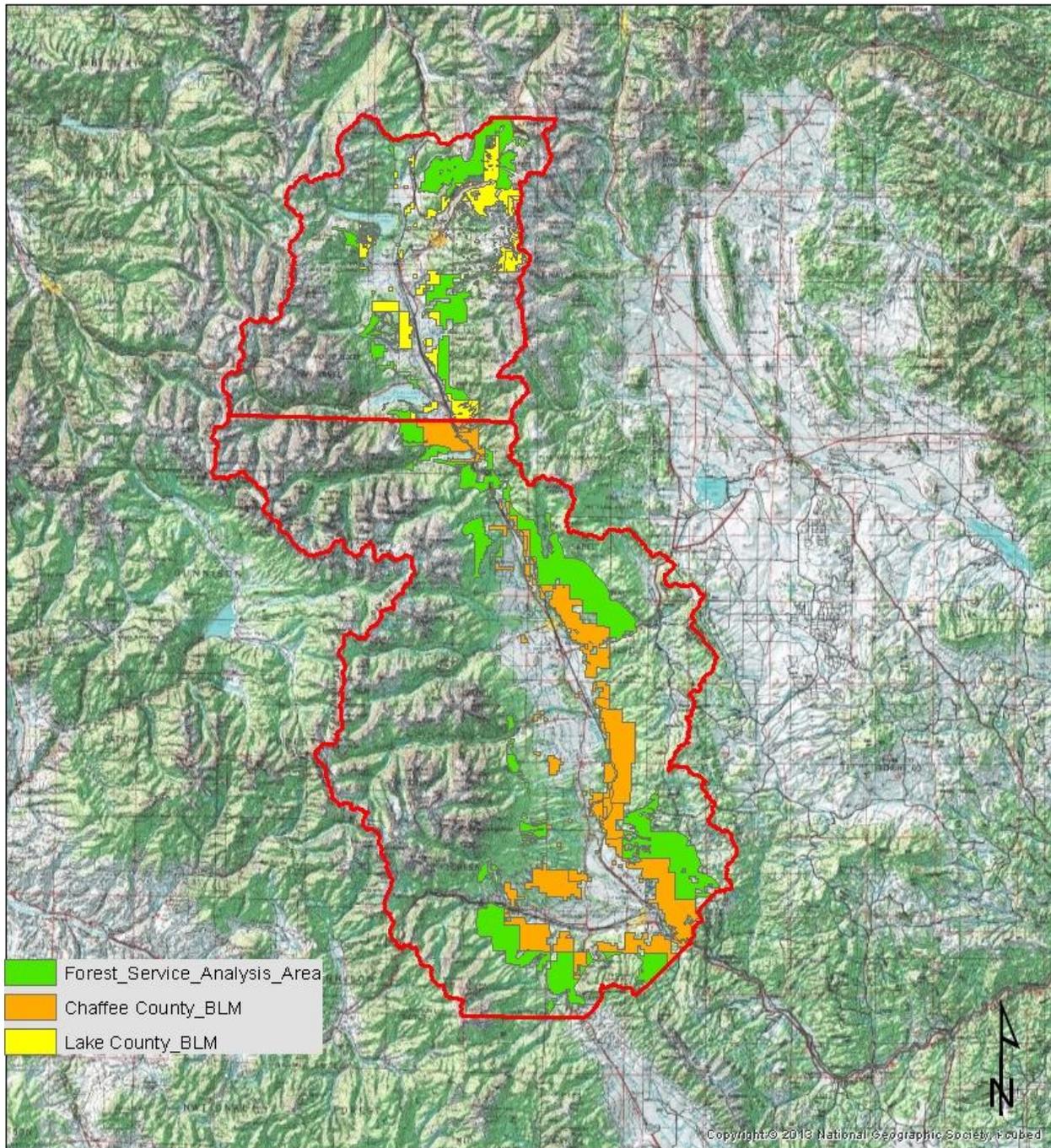
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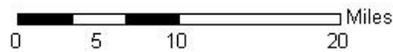
Figure 3. Forest Service managed lands located within two mile of Bureau of Land Management-Royal Gorge Field Office managed land within Chaffee and Lake Counties, Colorado. 2013.



**FOREST SERVICE ANALYSIS AREA**



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### **1.3 PURPOSE AND NEED**

**Wildlife:** Vegetative disturbance within the planning area has been reduced by fire suppression. Dense forest canopies have shaded out early seral shrubs and grasses that provide browse and forage for many ungulates. As a result, vigor of quality browse and forage plant species has been reduced, lowering carrying capacities of wild ungulates. Vegetation treatment projects have occurred within the analysis area, but are limited in size and scope. The lack of disturbance has reduced winter range browse and forage quantity and quality, negatively impacting ungulate populations.

The purpose of the proposed action is to provide a tool that ensures optimum population and a natural abundance and diversity of all natural resources on public lands. Projects completed through multi-program approach will cumulatively restore, maintain, and enhance vegetative conditions through actions integrated with other uses of public lands, through coordination with other programs, the States, and through direct habitat improvement projects.

**Fuels/Forestry:** In December 2003, Congress passed the Healthy Forests Restoration Act. This act provides special statutory processes for the types of treatments outlined in this document, as well as providing other authorities and direction to restore healthy forest conditions on lands of all ownerships. The intent of this Act is to speed up work needed to address overgrown and overstocked forests, bark beetle epidemics, and reduce the potential for catastrophic wildfire. The Healthy Forests Restoration Act specifically prescribes commercial logging as a tool to use in thinning overgrown forests.

Throughout the United States it is more and more common to see homes and other types of structures being built in wildland environments. This trend is creating an expansion of the wildland/urban interface where structures are located next to dense forests with high natural fuel accumulations. Because of their location, these structures are extremely vulnerable to fire should an unplanned wildfire occur in the surrounding forests. During the last decade, thousands of people have moved to the mountain areas of Colorado. Many of these people have moved into areas that are at significant risk of wildfire. Numerous ranches of substantial acreages have been sold and subdivided into small lots increasing the complexity of forest management, fuels reduction and wildfire suppression. The subdivisions immediately within the proposed project area are a classic example of the wildland-urban interface. Many of the lots in these subdivisions are less than five acres in size and have a variety of structures built on them. The risk of fire to the subdivisions has been recognized for many years but became very apparent during the summer of 2002 and 2012. Under the current conditions, vegetation is very susceptible to catastrophic fire and is classified as condition class 2 and 3. Congress has directed BLM to reduce wildfire hazards in the wildland-urban interface.

**Range:** In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the State. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands. Many of the allotments within the action area do not meet public health standards due to a lack of plant species diversity, overstocked forest stands, and excessive soil erosion.

## **1.4 DECISION TO BE MADE**

The BLM will decide whether to implement the proposed Vegetation Manipulation Management: Chaffee and Lake County Planning project based on the analysis contained in this Environmental Assessment (EA). This EA will analyze the impact of vegetation manipulation projects on BLM managed lands in Chaffee and Lake County. The BLM may choose to: a) implement the project as proposed, b) implement the project with modifications/mitigation, c) implement an alternative to the proposed action, or d) not implement the project at this time.

## **1.5 PLAN CONFORMANCE REVIEW**

**PLAN CONFORMANCE REVIEW:** The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

Name of Plan: Royal Gorge Resource Management Plan

Date Approved: 05/16/1996

Decision Number: 1-1, 1-14, 1-15, 2-1, 2-13, 2-14, C-25

Decision Language:

- Vegetation will be managed to accomplish other BLM initiatives i.e., riparian, wildlife, etc.
- Improved forage conditions will be distributed through cooperative efforts i.e., Colorado Habitat Partnership Program.
- Management of forest lands will be for enhancement of other values.
- Productive forested lands will be managed for sustained yield.
- A portion of the forested lands will be available for intensive management.
- Prescribed fire could be used as a management tool to enhance other resources.

In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the State. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands.

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes.

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods.

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential.

Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado.

Because standards exist for each of these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in Chapter 3 of this document.

## **1.6 SCOPING, PUBLIC INVOLVEMENT AND ISSUES**

**1.5.1 Scoping**: NEPA regulations (40 CFR §1500-1508) require that the BLM use a scoping process to identify potential significant issues in preparation for impact analysis. The principal goals of scoping are to allow public participation to identify issues, concerns, and potential impacts that require detailed analysis.

Persons/Public/Agencies Consulted: **Scoping will likely be completed through print media and BLM website.**

Issues Identified: **To be determined . . .**

# **CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES**

## **2.1 INTRODUCTION**

The purpose of this chapter is to provide information on the Proposed Action and Alternatives. Alternatives considered but not analyzed in detail are also discussed.

The project is designed to benefit resources managed by the wildlife, range, forestry and fuels programs managed by RGFO and FS. Therefore, each program has specific objectives to achieve while planning projects based on the proposed action. While projects are designed to benefit the lead program, many of the objectives achieved will benefit multiple programs.

Wildlife management objectives are to create a mosaic of seral stages that will support healthy big game population within their seasonal ranges. Many different treatment prescriptions may be used depending on target species benefit. When planning vegetation treatments, an important characteristic of mule deer to consider is they tend to be dispersed across the landscape, expressing less gregarious behavior, and have high site fidelity to seasonal ranges. Therefore, for deer, the goal is to create a high edge to open ratio by treating numerous small patch sizes (~3-12 acres) over large areas, and to maintain security cover near roads and development. Deer are reluctant to move to new areas for foraging or security until major changes have occurred. Elk, on the other hand, will readily change their behavior to take advantage of foraging opportunities and/or avoid disturbance from humans or predators. Elk are a more gregarious, herding species with more "plastic" site behavior. A beneficial strategy for elk may be to treat larger, less numerous areas given their different behavioral tendencies. Other considerations for

treatment strategies to benefit wildlife include the desired vegetation response, benefits to grazers versus browsers, the need for invasive control, and potential for natural or assisted reestablishment of vegetation (seeding).

The primary range management objective is to promote forage production, both quality and quantity, that will distribute permitted livestock more evenly across the range, minimizing over utilization and concentration areas. Secondly, objectives are to promote herbaceous plant diversity and reduce soil erosion, enhance forest health and diversity, and reduce wildlife conflicts on adjacent private land.

Forestry management objectives for this proposal are to improve forest health by reducing tree densities in overstocked stands and removing unhealthy trees. Improve forest or stand resiliency to natural disturbances by reducing stand densities and favoring healthy trees for retention. Increase forest age class diversity in all forest types by applying group selection or patch cutting treatments, and promote species diversity by favoring uncommon tree species for retention in treatment areas. Reduce bark beetle risk in overstocked stand by reducing stand densities. Finally, to support the local forest product industry by providing a continual supply of desired forest products.

The main objectives of fuels treatments are to reduce ladder and ground fuels and to create breaks in the continuous canopy. This reduces the chance of a fire getting into the crowns of the trees. Crown fires are difficult, and in most cases impossible to control. These thinned areas can give fire fighters a better chance to safely employ suppression tactics, or to manage a wildfire with minimal loss or damage to property, habitat, or critical infrastructure. The ultimate goal of the mechanical treatment is to create a fuel arrangement and amount on the landscape to be able to return fire back to the ecosystem with the use of prescribed fire in the future. Congress passed the Healthy Forests Restoration Act (HFRA) and the Healthy Forests Initiative (HFI) that provides special statutory processes for hazardous fuels reduction projects, and it also presents other authorities and direction to help reduce hazardous fuels and to restore healthy forest conditions on lands of all ownership's. This Environmental Assessment is being completed using HFRA/HFI authorities for projects with a primary objective of fuels reduction. Fuels reduction projects typically differ from other vegetation treatment projects in that vegetation patterns, densities and slash disposal are focused more on altering fire behavior. Secondary benefits to these treatments include wildlife habitat enhancement, improved forage quantity and quality for wildlife and cattle, and improved forest health. To the casual observer projects designed to meet these objectives may not look much different and treatment methods are similar.

Riparian management objectives could be to enhance photosynthesis (e.g. enhance production at a wooded toad habitat location, fishery rearing area, open areas around artificial water impoundments that have become forested). Other program objectives are to sustain aspen or other favored trees along suitable riparian habitats where encroached by evergreen trees, create large woody debris that is available for in-stream habitat, and promote enhanced understory that may reduce overland flow and sediment entering aquatic habitat. Finally, a program objective would be to maintain a Potential Conservation Areas ecological condition as defined by the

Colorado Natural Heritage Program where unique vegetation communities may be impaired by heavy evergreen encroachment moving a community far from its ecological range of variability.

## **2.2 ALTERNATIVES ANALYZED IN DETAIL**

### **2.2.1 Proposed Action**

The proposed action is to complete an umbrella environmental assessment that will cover a wide range of vegetation treatment types within the planning area. This assessment will remain valid a maximum of 10 years past signature date. Treatment methods include the use of mechanical and hand tools, and prescribed fire (pile burning, broadcast burning, etc.). Any single project may not exceed 1000 treated acres per year, and cumulatively, projects may not exceed 2500 treated acres per year within the planning area. However, unplanned vegetation disturbance (e.g. wild-/natural fire, blow downs) will not be incorporated into the 2500 acres ceiling.

The utilization of the trees to be removed will be encouraged. Spruce, Douglas-fir, ponderosa pine, lodgepole pine and aspen are all considered commercial species with value as various forest products depending on size and form. Trees classified as saw timber designated for removal would be utilized for lumber or house logs. Smaller trees may have value as fuel wood, posts or poles. Areas may be opened for Special Forest Product (SFP) harvesting. Local demand for SFP includes transplants, post and poles, Christmas trees, and fuel wood. Removing the vegetative materials to be used as biomass would be beneficial for the treatment areas, reduce prescribed burning costs, and provide the community with a renewable energy source. The harvesting of SFP requires a permit and special mitigations to protect roads and land resources.

Through the Healthy Forest Initiative, the BLM has the authority to enter into stewardship contracts to reduce wildland fire hazard and improve forest health. Stewardship contracts are long-term (up to 10 years) and may be used to fulfill a number of program objectives. Contracts may be designed to improve, maintain or restore forest or rangeland health, restore or maintain water quality, improve fish and wildlife habitat, and reduce hazardous fuels that pose risks to community and ecosystem values. Commercial harvesting of trees (e.g. saw timber, biomass, fuel wood, transplants) through stewardship contracts prior to treatment could reduce treatment costs and create local jobs. The new authority allows contractors, community groups, and others to retain removed forest product as full or partial payment services depending on the value of wood and services performed. Without further appropriation, the BLM can apply gained credit to the project site or any other stewardship project site. Stewardship contracts foster public and private partnership and provide contractors with an incentive to invest in equipment and facilities needed to conduct projects on BLM lands.

This project would be a long term investment and would require monitoring and periodic maintenance to retain its effectiveness. Monitoring will consist of measuring pre-treatment and post-treatment vegetative characteristics to ensure the desired outcome had been obtained. Periodic maintenance or enhancement of past vegetation manipulation would also be authorized to retain effectiveness of projects. Maintenance would be accomplished through any of the actions described above, i.e., hand work, Christmas tree cutting, transplant harvesting, hydro-mulching, or by prescribed burning with a low to moderate intensity surface fire. Enhancement projects would occur adjacent to past treatment areas, managing for age class diversity while creating a mosaic pattern on the landscape. Projects of this nature will temporarily delay

succession, maintaining resistance to catastrophic fire and allow additional time for grass, forb, and shrub establishment.

The existing roads map delineates the access points into the project area (Figure X). Any existing roads used to remove forest products will be maintained and improved. No new permanent roads will be created by specific projects. All temporary roads created for access and forest product removal will be closed upon completion of the treatment. Road closures will be done with natural surrounding materials such as large rocks or logs, tank traps, and buck and rail fences where appropriate. Roads will then be posted as closed to vehicle access. All road closures will be coordinated with current and future travel management plans. No private roads will be used for removing forest products unless approved by the owner. Treatments and hauling of forest products will be done when the ground is either frozen or dry to prevent soil and road damage. Operators will be required to stop work during the wet periods.

When vegetative conditions warrant, seeding of treated areas will be considered to expedite the establishment of vegetation (Table 1). Seed mixture and rate will be determined on a site by site basis and selected based on project objectives. The species selected would be adapted to the site and consist of a mixture of cool and warm season vegetation species. Where artificial seeding is required emphasis will be placed on using native plant species. However, seeding of non-native species will be considered based on project objectives and native seed availability. The use of non-native species would be limited to less than 10% of the total seed mix composition and consist of species that have a low persistence. All seed would be certified for content, viability and meet the BLM standard for weed free.

Table 1. Plant species available for seed mixtures, Bureau of Land Management-Royal Gorge Field Office and San Isabel National Forest, 2013.<sup>1</sup>

Native			
Common Name	Scientific Name	Common Name	Scientific Name
Indian Rice Grass	<i>Oryzopsis hymenoides</i>	Squirrel Tail	<i>Elymus elymoides</i>
Western Wheat Grass	<i>Pascopyrum smithii</i>	Arizona Fescue	<i>Festuca arizonica</i>
Sand Dropseed	<i>Sporobolus cryptandrus</i>	Blue Grama	<i>Bouteloua gracilis</i>
Pine Dropseed	<i>Blepharoneuron tricholepis</i>	Sideoats Grama	<i>Bouteloua curtipendula</i>
Prairie Junegrass	<i>Koeleria macrantha</i>	Mountain Mahogany	<i>Cercocarpus montanus</i>
Wax Current	<i>Ribes cereum</i>	Winterfat	<i>Krascheninnikovia lanata</i>
Four Wing Saltbrush	<i>Atriplex canescens</i>	Buckwheat	<i>Fagopyrum esculentum</i>
Parry Oatgrass	<i>Danthonia parryi</i>	Thurber's Fescue	<i>Festuca Thurberi</i>
Mountain Brome	<i>Bromus marginatus</i>	Slender Wheatgrass	<i>Agropyron trachycaulum</i>
Canada Wildrye	<i>Elymus canadensis</i>	-	-

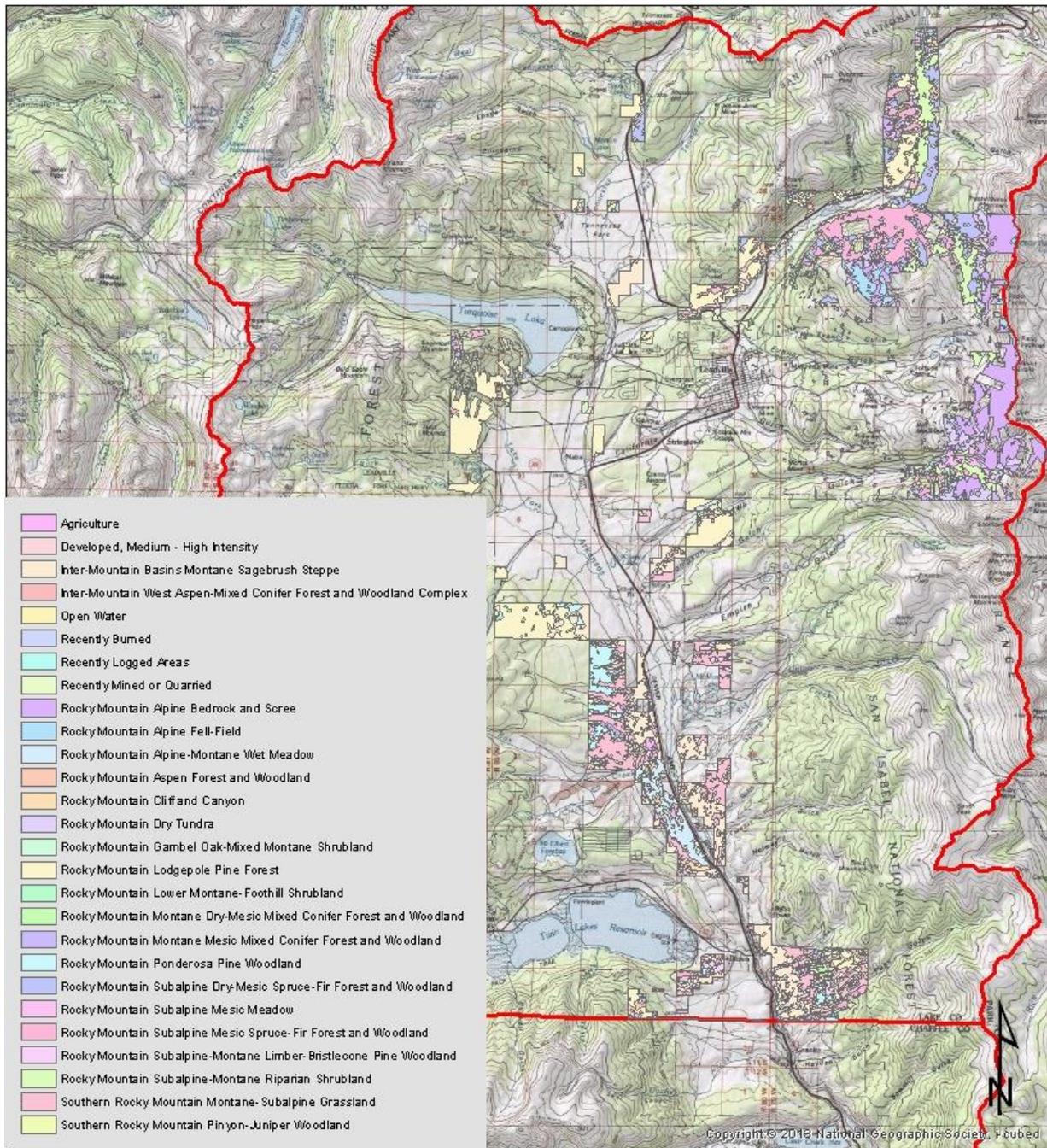
  

Non-native	
Common Name	Scientific Name
Ladak Alfalfa	<i>Medicago Sativa</i>
Small Burnett	<i>Sanguisorba minor</i>

<sup>1</sup>Species used in seed mixtures are subject to change.

In general, the treatment size and types used would be dictated by the vegetation classification, terrain, and project objectives. The BLM managed lands within the planning area encompasses a variety of vegetation types; however, the dominant classifications include piñon/juniper, mixed conifer forest and ponderosa pine (Figures 4-6, Tables 2,3). The forest service managed lands contain a variety of vegetation types, but primarily consist of grasslands, piñon/juniper woodlands, and ponderosa pine forests (Figures 7-9, Table 4).

Figure 4. Vegetation classification of Bureau of Land Management-Royal Gorge Field Office managed lands, Lake County, Colorado, 2013. Vegetation data was modeled from 1999-2001 satellite imagery in conjunction with digital elevation model datasets.



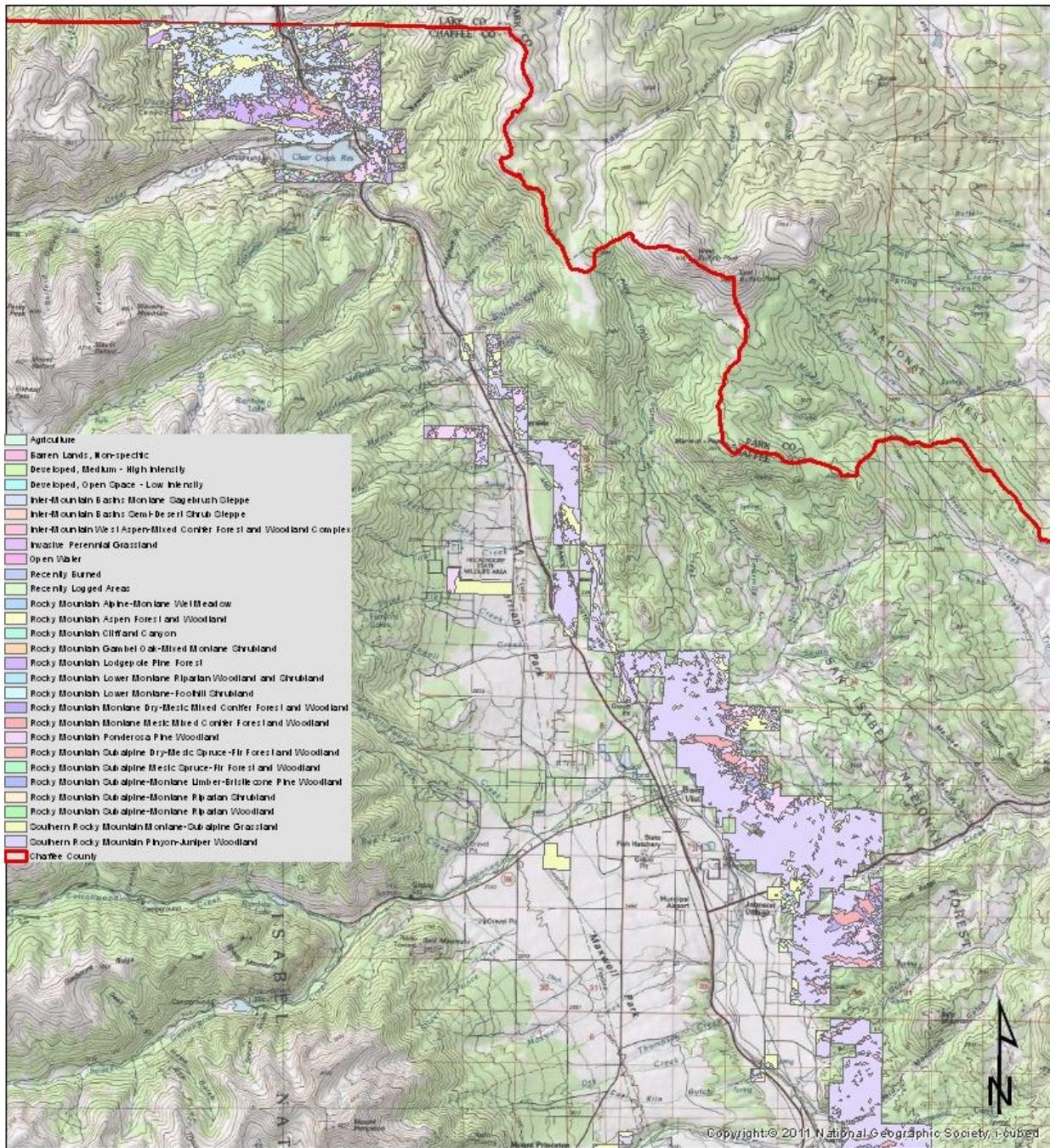
**VEGETATION CLASSIFICATION ON BLM  
LAKE COUNTY**

DOI-BLM-CO-200-2013-0050



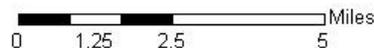
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Figure 5. Vegetation classification of Bureau of Land Management-Royal Gorge Field Office managed lands, north half Chaffee County, Colorado, 2013. Vegetation data was modeled from 1999-2001 satellite imagery in conjunction with digital elevation model datasets.



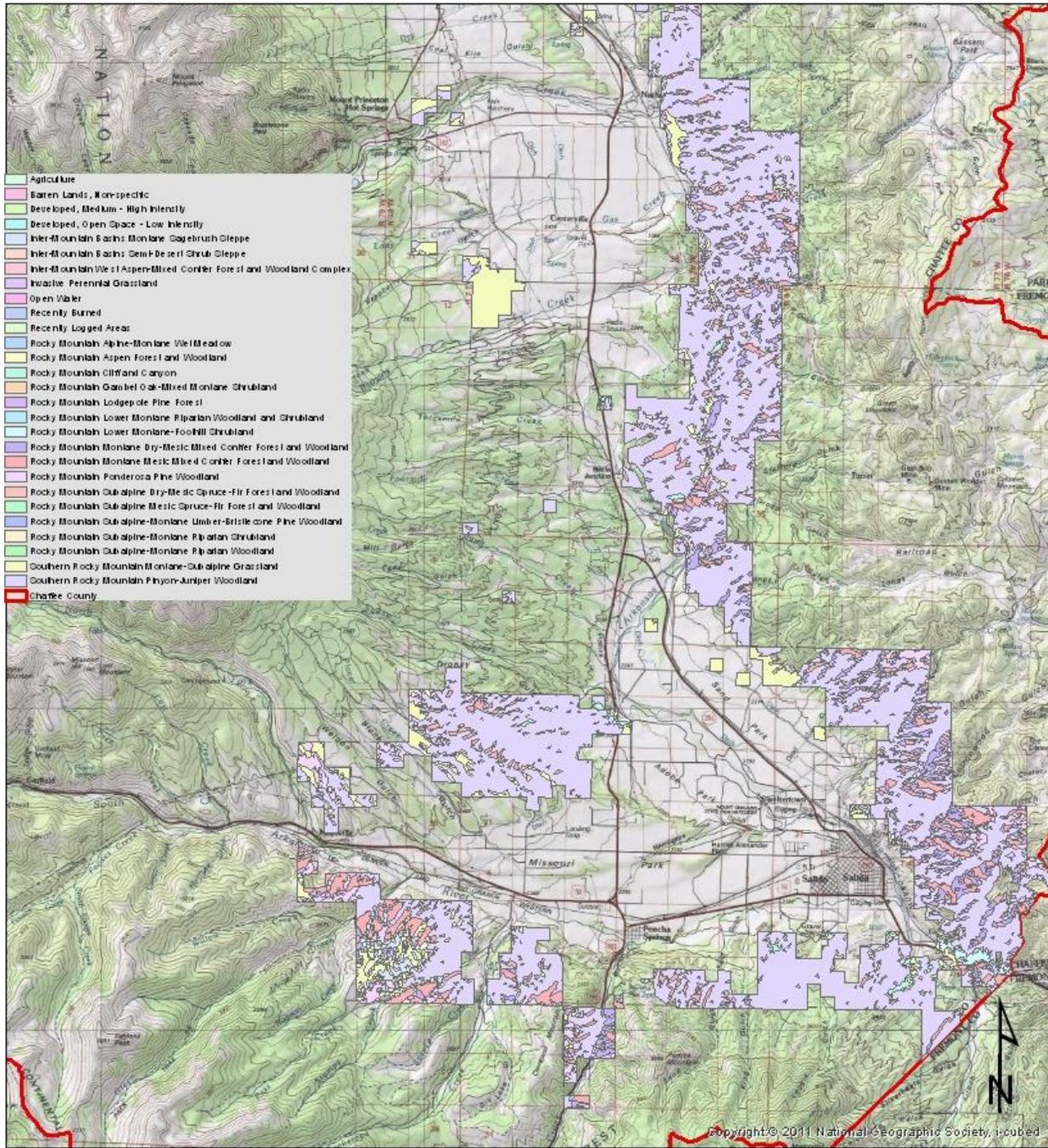
**VEGETATION CLASSIFICATION ON BLM  
CHAFFEE COUNTY - NORTH HALF**

DOI-BLM-CO-200-2013-0050



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Figure 6. Vegetation classification of Bureau of Land Management-Royal Gorge Field Office managed lands, south half Chaffee County, Colorado, 2013. Vegetation data was modeled from 1999-2001 satellite imagery in conjunction with digital elevation model datasets.



**VEGETATION CLASSIFICATION ON BLM  
CHAFFEE COUNTY - SOUTH HALF**

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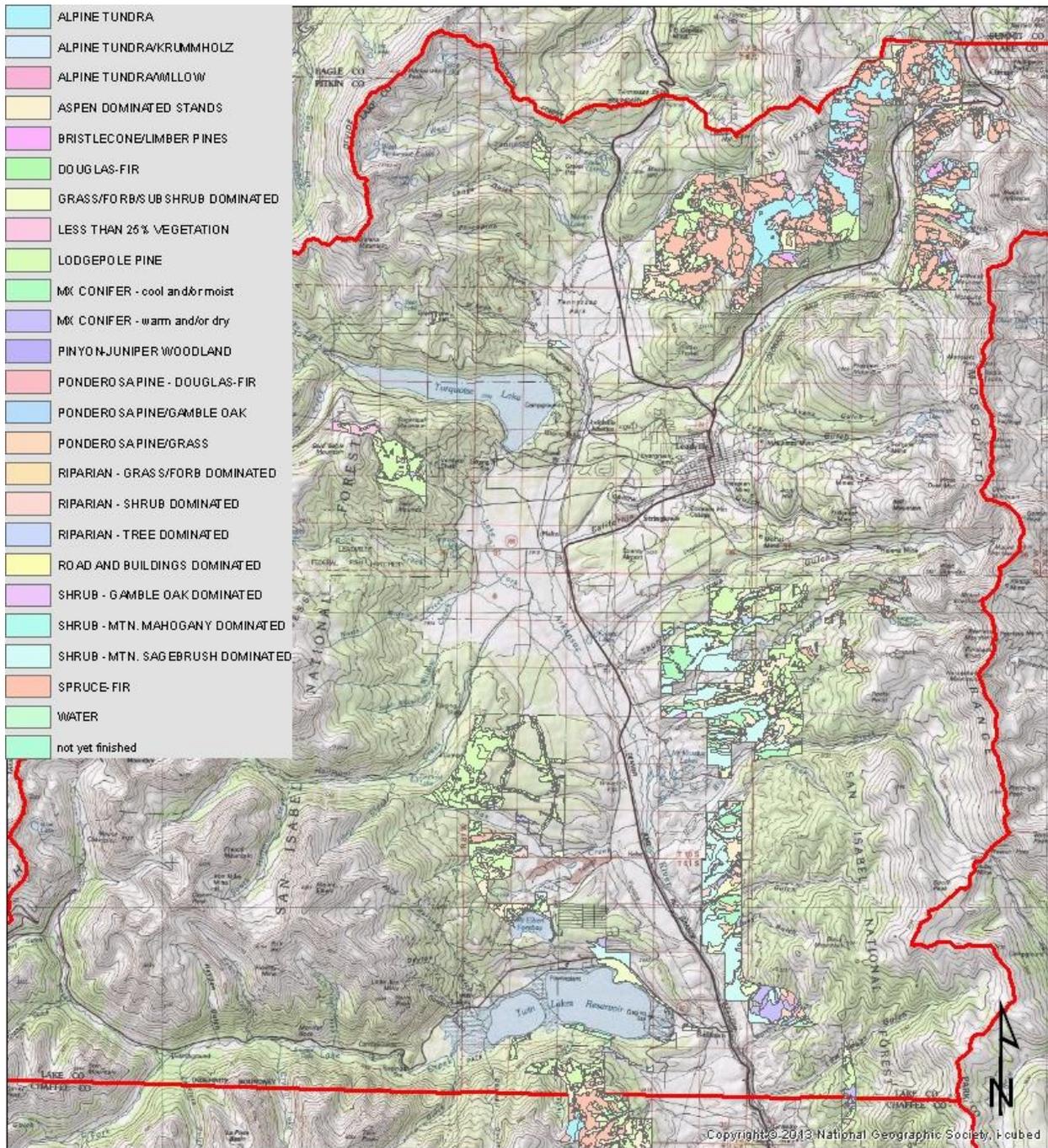
Table 2. Vegetation classification of land managed by Bureau of Land Management-Royal Gorge Field Office in Lake County, Colorado. Vegetation data was modeled from 1999-2001 satellite imagery in conjunction with digital elevation model datasets.

Vegetation Description	Acres
Agriculture	97.51
Developed, Medium - High Intensity	5.85
Inter-Mountain Basins Montane Sagebrush Steppe	2688.98
Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex	17.13
Open Water	3.75
Recently Burned	5.00
Recently Logged Areas	28.08
Recently Mined or Quarried	12.75
Rocky Mountain Alpine Bedrock and Scree	1922.41
Rocky Mountain Alpine Fell-Field	408.85
Rocky Mountain Alpine-Montane Wet Meadow	542.31
Rocky Mountain Aspen Forest and Woodland	293.16
Rocky Mountain Cliff and Canyon	171.19
Rocky Mountain Dry Tundra	830.30
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	36.03
Rocky Mountain Lodgepole Pine Forest	3700.21
Rocky Mountain Lower Montane-Foothill Shrubland	0.96
Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	97.22
Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland	119.49
Rocky Mountain Ponderosa Pine Woodland	584.71
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	1394.70
Rocky Mountain Subalpine Mesic Meadow	340.66
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	1654.95
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	450.62
Rocky Mountain Subalpine-Montane Riparian Shrubland	1635.42
Southern Rocky Mountain Montane-Subalpine Grassland	2382.83
Southern Rocky Mountain Pinyon-Juniper Woodland	1.02
<b>Grand Total</b>	<b>19426.08</b>

Table 3. Vegetation classification of land managed by Bureau of Land Management-Royal Gorge Field Office in Chaffee County, Colorado. Vegetation data was modeled from 1999-2001 satellite imagery in conjunction with digital elevation model datasets.

Description	Acres
Agriculture	27.66
Barren Lands, Non-specific	7.66
Developed, Medium - High Intensity	27.26
Developed, Open Space - Low Intensity	10.12
Inter-Mountain Basins Montane Sagebrush Steppe	2575.41
Inter-Mountain Basins Semi-Desert Shrub Steppe	60.52
Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex	24.34
Invasive Perennial Grassland	0.08
Open Water	166.35
Recently Burned	51.79
Recently Logged Areas	4.99
Rocky Mountain Alpine-Montane Wet Meadow	1.85
Rocky Mountain Aspen Forest and Woodland	280.86
Rocky Mountain Cliff and Canyon	397.21
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	16.84
Rocky Mountain Lodgepole Pine Forest	850.95
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	9.34
Rocky Mountain Lower Montane-Foothill Shrubland	165.13
Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	2931.63
Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland	4114.91
Rocky Mountain Ponderosa Pine Woodland	2834.65
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	113.48
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	105.78
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	373.44
Rocky Mountain Subalpine-Montane Riparian Shrubland	143.44
Rocky Mountain Subalpine-Montane Riparian Woodland	5.91
Southern Rocky Mountain Montane-Subalpine Grassland	5114.62
Southern Rocky Mountain Pinyon-Juniper Woodland	33548.81
<b>Grand Total</b>	<b>53965.04</b>

Figure 7. Vegetation classification of Forest Service managed lands, Lake County, Colorado, 2013.



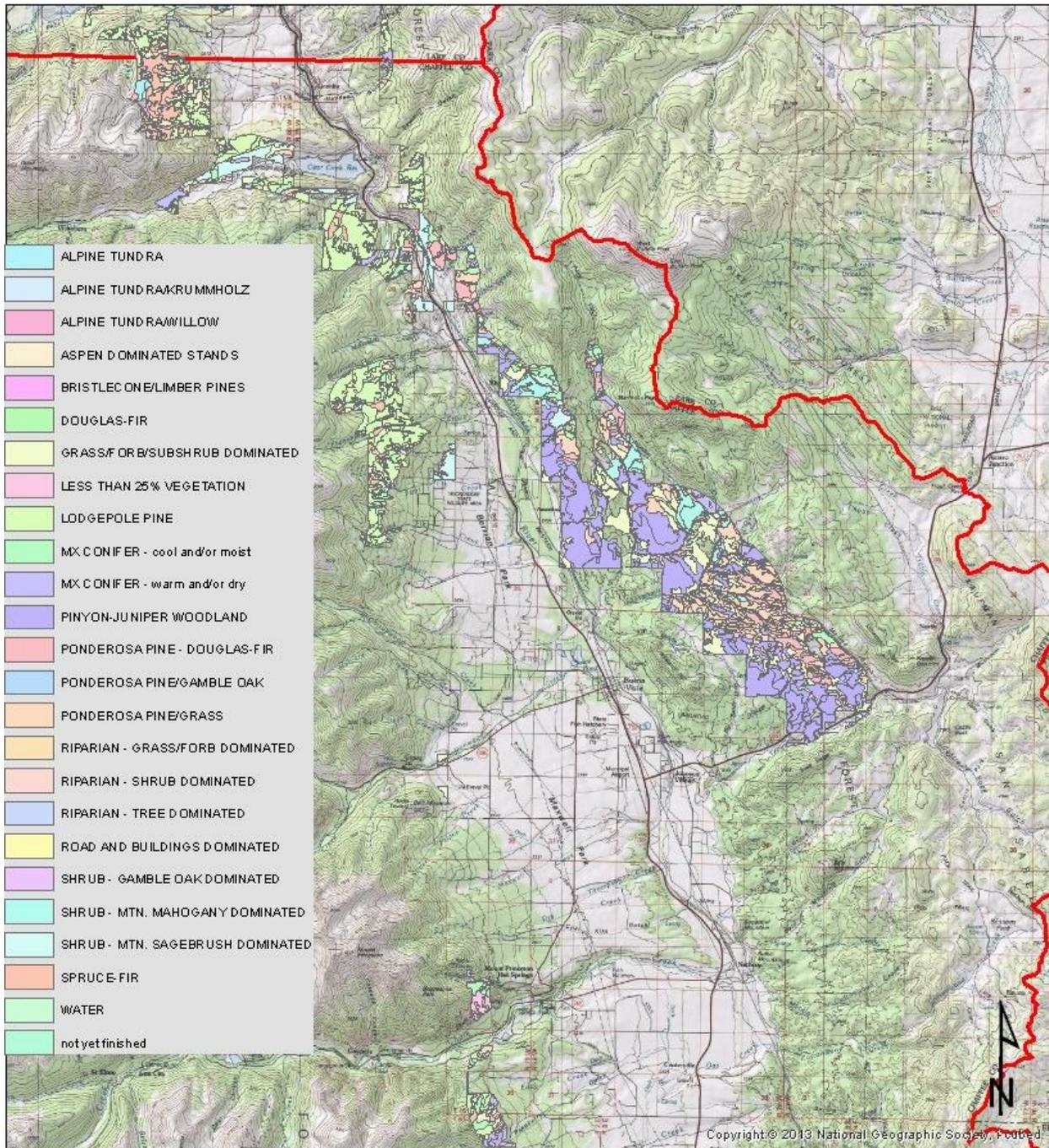
**VEGETATION CLASSIFICATION ON FOREST SERVICE  
LAKE COUNTY**

DOI-BLM-CO-200-2013-0050

0 1.5 3 6 Miles

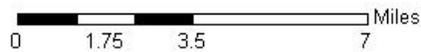
**NOTE TO MAP USERS**  
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of the data layers shown on this map. The official land records of the data providers should be checked or current status on any specific tract of land.

Figure 8. Vegetation classification of Forest Service managed lands, north half Chaffee County, Colorado, 2013.



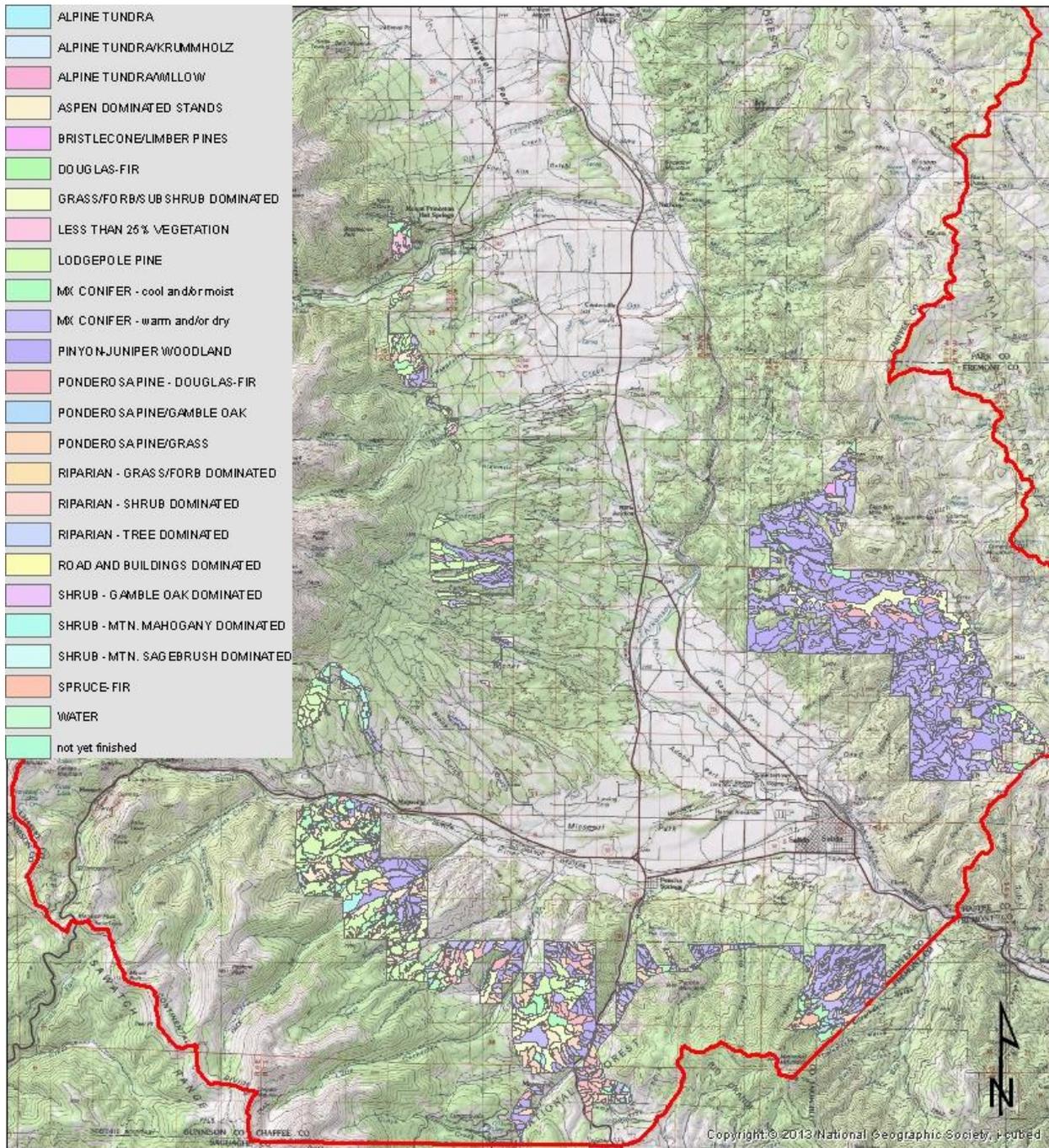
**VEGETATION CLASSIFICATION ON FOREST SERVICE  
 CHAFFEE COUNTY - NORTH HALF**

DOI-BLM-CO-200-2013-0050



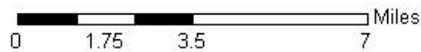
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Figure 9. Vegetation classification of Forest Service managed lands, south half Chaffee County, Colorado, 2013.



**VEGETATION CLASSIFICATION ON FOREST SERVICE  
CHAFFEE COUNTY - SOUTH HALF**

DOI-BLM-CO-200-2013-0050



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Table 4. Vegetation classification of land managed by the Forest Service in Chaffee and Lake County, Colorado.

Description	Acres
Bare Soil/Rock	917.83
Grass	14665.73
Gamble Oak	178.44
Mountain Mahogany	2103.27
Alder/willow	1089.23
Sagebrush	3821.48
Spurce/Fir	5947.02
Bristlecone/Limber Pine	182.06
Douglas Fir	8426.03
Aspen	5359.21
Lodgepole Pine	12641.33
Cottonwood	117.06
Ponderosa Pine	5733.83
Pinyon/Juniper	14339.23
Water	29.11
Grand Total	75550.86

### Treatment Descriptions

**Conifer restoration thinning:** This prescription involves retaining large ponderosa pine or Douglas-fir (fire-adapted trees), while removing smaller and less fire resilient trees like lodgepole pine, spruce and all present unhealthy large trees (small crown ratios, insect infested, or diseased). A representation of all species and age classes will be reserved to maintain stand structure and diversity. However, fire adapted tree species, those characterized by thick bark, larger established root systems, and a higher crown base height, will be selected over other less fire adapted species. Reserve tree densities will vary by species based on site conditions and predicted historic fire regime. The typical reserve tree densities will vary from 50 to 100 trees per acre. One-half to 1 acre openings will be created in unhealthy tree patches to promote herbaceous and sapling growth. Conifer restoration thinning opens the canopy, thins overstocked stands, maintains wildlife snags and down woody debris, and promotes vigor, all indicators of a healthy forest.

**Aspen restoration thinning:** This prescription will concentrate on the removal of most conifers such as Douglas-fir, spruce and lodgepole pine, regardless of their size, encroaching into aspen stands. The removal of encroaching conifer will improve aspen vigor by providing additional soil moisture during dry periods. To ensure aspen age class diversity, multi-age aspen trees will be retained. The retained aspen reserve tree density will depend on the number and size of trees in each treatment stand. Small pockets of conifers, less than ½ acre in size, that exhibit good

wildlife hiding cover characteristics will be retained within aspen stands. The result of this treatment, as evidenced by similar treatments within the BLM Royal Gorge Field Office, will likely be suckering or a flush of new sprouts from the roots of the aspen clone creating a second age class of aspen.

**Patch cutting or group selection:** This prescription will focus on the removal of all large trees in 5 to 20 acre groups. This treatment will be utilized in all forest types except ponderosa pine and healthy Douglas-fir stands. The treatment prescription is useful in dense lodgepole forest that create a monoculture of lodgepole pine with very little understory, essentially creating a biological desert. Patch cutting or group selection will increase forest age class diversity and early seral wildlife habitat, two important healthy forest indicators. Treatment areas will be designed for wildlife benefit by keeping them away from open roads, feathering the edges, and varying size and shape. Given the relatively small size patches, the likelihood of any large scars on the landscape is minimal.

**Seed tree with reserves:** This prescription involves reserving 15 to 20 of the healthiest, best seed producing trees per acre to provide a natural seed source throughout the treatment area. In this case the most fire-adapted trees such as ponderosa pine or Douglas-fir will typically be reserved; all other trees will be harvested and removed. This type of treatment, again following the theme of the proposed action, improves the action area's forest age class diversity, and provides early seral wildlife habitat. Seedlings from the carefully selected seed trees should establish within 5 to 10 years of this activity. The selection and reservation of seed trees, followed by a site preparation prescribed burn, assures a healthy diversified forest in the future.

**Pre-commercial:** This prescription will remove most small trees (usually less than 8 inches in diameter) in all conifer forest types; however, some small trees will be reserved for stand diversity. This treatment will be utilized where access and/or slope limits mechanical equipment and/or in stands where there is the need to only remove small trees to meet density objectives. This treatment typically involves thinning with chainsaws and piling of the materials. If there is public motorized access, fuel wood will be removed through personal use or commercial sales, thereby reducing the burning of the larger materials. The utilization of hand thinning techniques allows thinning of small diameter trees in thick stands and steep slopes, thereby creating a more diversified forest.

**Salvage:** The objectives of this prescription are to remove trees previously killed and currently under attack by bark beetles. This prescription will remove heavy fuels or large diameter wood from the site reducing future wildfire severity and intensity, improve forest aesthetics by removing a portion of the standing dead trees, improve wildlife habitat, and provide a desirable forest product. Green trees currently infested will release a new generation of beetles the following summer. Each new generation of bark beetles that emerges from one tree is likely to kill an additional 4 to 5 trees. Salvage may also include trees that had previously died as a result of wildfire. Trees will likely be salvaged by commercial firewood harvesters, or those interested in house logs. The work is likely to be performed with chainsaws, small tractors, pickup trucks, trailers or small log hauling trucks on slopes less than 35%.

## Treatment Methods

**Prescribed fire:** Prescribed burning could take place in mechanically treated areas and possibly areas that are too difficult to treat by mechanical methods. The prescribed burning of natural and treatment fuels will reduce the size, intensity, severity, and effects of future wildfires. The re-introduction of prescribed fire also aids in forest regeneration by releasing nutrients to all plants, currently tied up in dead material. Site specific burning prescriptions will be designed to accomplish the stated resource management objectives for the project area. Fire intensities will be variable; however a low to moderate intensity fire is most desirable for first-entry burns aimed at reintroducing fire into these forests and raising canopy base heights. Prescribed burning will utilize existing control features such as roads and creeks, and construct new features as needed.

Where appropriate shaded fuel breaks, between BLM lands and private lands, will be created. Shaded fuel breaks are strips of land where trees are thinned, lower branches are pruned and dead and downed trees and brush are removed. Fuel breaks create a park-like appearance that alters wild land fire behavior by keeping it on the forest floor where it is the easiest to control. Fuel breaks, unlike firebreaks that are intended to stop a fire with clear-cuts, simply slow the fire down enough to give firefighters a reasonable opportunity of control. The average width of the fuel break will vary depending on terrain, timber types and proximity to private land. Shaded fuel breaks also provide excellent anchor points and control features for future prescribed burns. Through prescribed burning and pruning, crown base heights can be increased to reduce surface to crown fire transition. Shaded fuel breaks serve a multitude of uses; such as protecting adjoining private property, providing fire control features and slowing the progression of a wildfire.

**Mechanical Treatments:** Mechanical treatments are likely to include tree spades, feller-bunchers, skidders, log loaders, and/or similar equipment (Figure 7). The machines used in mechanical treatments are typically limited to slopes of less than 35%. The type of machine used will be determined based on the current status of the treatment area and the final desired outcome.

The Hydro-Ax is a large articulated tractor with a 6-8 foot wide, hydraulically controlled mower/mulcher head mounted on the front. The machine has rubber, flotation-type tires which result in minimal ground disturbance. The machine has the capability of being highly selective and can meander through a stand of trees removing selected trees, or patches to create a desired mosaic. The machine chops and mulches the plant material into the desired size, which can range from fist-size to 3-4 foot long sections or larger. Stump height can be controlled, and may vary from below ground level to any desired heights. It can operate on most ground surface conditions, including rather large sized rocks. The Hydro-Ax head is lifted above the tree or shrub top and lowered quickly, usually completely chopping the plant in less than 15 seconds. The Hydro-Ax is used in most vegetative types including mountain shrub, and pinyon/juniper stands with stem diameters up to 15-18 inches.

Roller chopping provides moderate brush control through the crushing and cutting action of the drum and blades. Most species of brush that have re-sprout capabilities will readily initiate new growth from the base. These shoots are often valuable browse to wildlife and livestock until the

stems and leaves become unpalatable. The chopper provides canopy removal and temporary release of understory grasses from brush competition. The cutting action of the blades into the soil often increased infiltration of water and provides a better seedbed than shredding. The relatively lower cost of roller chopping can provide a more economical maintenance practice.

The brush hog is a large rotary mower pulled behind an 80-100 hp tractor equipped with a P.T.O. Its use would be limited to sagebrush and other small shrubs in areas that were fairly gentle terrain and with no large rocks or down trees. Best results occur in brush stands where good residual herbaceous vegetation is present. Because ground disturbance is minimal, seeding success is usually not good. The height to which the target species is cut may range from ground level to 12-15 inches high. The degree of brush mortality and re-growth can be controlled by the height above ground level the plants are cut. Cutting to less than 4 inches will probably result in 85-100% mortality. Leaving greater than a 10 inch height may result in a kill of only 40-60%. The mobility of this tool will facilitate ease in creating a complex treatment design.

The “Dixie Harrow” consists of a large spike tooth harrow pulled by a 4-wheel drive rubber tired tractor equipped with a three-point hitch. The Dixie harrow can be used in sagebrush or other small shrub stands and offers a high degree of control with results similar to fire. Factors such as the pattern of treatment, residual density of shrubs, seeding, and timing all can be controlled. In most cases, a once over treatment will reduce shrubs by 50-60%, and a twice over treatment will result in a 90-95% reduction.

Commercial forest product removal consists of a number of types of operations, including logging, post and pole and firewood cutting. These tools may be used in lieu of other treatment methods if it meets the project objectives, is feasible, economical and provides local economic benefit. A wide range of situations may exist for use of this tool depending on the condition of the forest product market at the time the project is desired. Development of new sustainable harvesting methods will be an important restoration tool.

Figure 7. Photos of potential mechanical treatment methods available to the Bureau of Land Management-Royal Gorge Field Office and San Isabel National Forest, 2013. However, mechanical treatments will not be limited to listed equipment.



Hydro-mulcher



Roller Chopper



Brush Hog



Mower



Dixie Harrow



Skidder



Feller Buncher



Dozer

## **Hand Treatments**

Hand treatments are likely to occur where mechanized equipment cannot access primarily due to slope and topography, although other circumstances may arise. Hand treatments includes the use of any hand (human powered) tools and chainsaws.

## **Mitigation**

The following measures will be common to all projects:

1. Locate, flag, and protect any property survey monuments including brass cap monuments, bearing trees, fences, or other infrastructure that may exist in the project area.
2. All machinery will be washed prior to being brought on site. The disturbed areas will be inspected and treated as needed for noxious weeds for two growing seasons after the project is completed.
3. Large machinery for mechanical treatment will stay more than 100 feet from riparian and wetland areas and not work off road when ground conditions are saturated. When possible, work by large machinery will be conducted when the ground is frozen.
4. Fueling of machinery will be conducted at designated fueling sites. No more fuel than is necessary for daily operations will be stored on site. If fuel volumes in excess of 25 gallons are released to the environment in a spill, the BLM project administrator will be notified and appropriate cleanup measures taken.
5. Determine public and private boundaries of the treatment areas prior to project implementation.
6. Minimize off-road travel while performing and supervising the operations. New vehicular travel routes will be rehabilitated and closed, especially where they connect to the existing roads and trails. Existing roads and trails will be used as much as possible by agency and contractor personnel to eliminate development of new routes and trails.
7. Projects will be designed to blend with topographic forms and existing vegetation patterns to screen the project as much as possible.
8. Slash piles will not exceed 20 feet in diameter by 15 feet in height, and will be located where they can be burned effectively in suitable weather conditions while not threatening the crown of reserve vegetation.
9. Manipulation of green vegetation will be avoided from May 15th thru July 15th to avoid the taking of migratory birds.

10. In ponderosa pine and mixed conifer habitats, surveys will be completed to detect raptor nests and roosts and migratory bird cavity nest sites. Raptor nests and roosts will be protected from harvest and damage during project implementation. Trees that contain cavity nests will be retained.
11. When possible, work in piñon/juniper forest type will take place between September 1st and April 1st to avoid the Ips bark beetle flight period, avoiding increased beetle activity within and adjacent to treatment areas.
12. The RGFO will reserve the right to impose additional timing restrictions based on concerns related to bark beetle infestations.
13. Mechanical treatments will not take place on slopes greater than 35%.
14. Smoke from prescribed fire use will be monitored. All burn plans will contain a monitoring plan. Monitoring may consist of visually tracking smoke plumes by persons on the ground or in aircraft and by installing PM10/2.5 particulate monitors at sensitive receptors.
15. Surveys will be conducted to locate occurrences of Royal Gorge stickleaf, Brandegees wild buckwheat, dwarf milkweed, and golden blazing star if suitable habitat exists. If possible, areas where these plants are located will be avoided.
16. Local research will be conducted to locate private survey records that apply to the project area.
17. Surveys for goshawk and Townsend's big-eared bat will be completed before project implementation if suitable habitat exists.
18. Wildlife trees (snags, roosts, etc.) will be protected from damage and retained for wildlife use.
19. Contract stipulations addressing fences and gates will be addressed for range allotment management purposes.
20. If needed, consultation with Colorado Parks and Wildlife will occur for recently treated areas regarding the allocation of additional forage and/or application of temporary grazing restrictions.

Currently, funding is limited for project implementation. The RFGO and FS are actively seeking outside funding sources such as the Rocky Mountain Elk Foundation, National Wild Turkey Federation, Bighorn Sheep Society, Mule Deer Foundation, Colorado Parks and Wildlife, and Colorado State Council of Habitat Partnership Program. Priority projects will be ranked and completed as funding is made available.

### **2.2.2 No Action Alternative**

Under this alternative, forest health or fuels reduction treatments will not occur. Forest health will continue to decline with trees dying due to competition with neighboring trees for limited soil moisture. The bark beetle risk in all coniferous forest types is expected to increase as tree densities increase, forests age, and with the occurrence drought. Aspen will continue to be replaced by conifers throughout the area, a phenomenon seen throughout Colorado. Fire adapted species such as ponderosa pine and aspen will continue to be replaced by shade tolerant and fire intolerant species. The dead and/or dying trees will add to fuel loads, increasing the potential for a catastrophic wildfire threatening life, private property, and infrastructure.

The No Action Alternative does not contribute to the sustainability of the forests within the project area, nor does it meet the purpose and need of this project. Rather, the no action alternative maintains the status quo. Unfortunately, the status quo is characterized by high stand densities existing with limited soil moisture and an increasing number of fire intolerant and shade tolerant species. These conditions are atypical in forests with a history of low and mixed severity fires, and favor the buildup of litter, duff, and ladder fuels. The result is an increased probability of catastrophic crown fires that replace entire forest stands. Therefore, the no action alternative could lead to a potentially dangerous situation whereby wildfire could denude the landscape and damage adjoining private property.

There are negative economic impacts associated with a major landscape disturbance, such as a catastrophic crown fire. Tourism, a major industry in Colorado, is directly affected by the loss of vistas and aesthetically pleasing places to recreate. For example, large areas in and near the San Juan National Forest were closed in response to the Missionary Ridge Fire near Durango, Colorado. The summer tourist season dependent businesses lost nearly an entire year of business. While the financial implications of the mountain pine beetle epidemic in Grand County, Colorado has yet to be determined, the visual impacts caused by this infestation are staggering. This is a perfect example of what can occur when insects take advantage of even-aged forests that are stressed by competition.

Wildfire, a potential result of the no action alternative, affects the entire forest ecosystem. For example, soils that experience extreme heat become hydrophobic. Hydrophobic soils reduce moisture infiltration, which limits vegetative establishment, in turn contributing to increased runoff and stream sedimentation. The smoke created by wildfires degrades air quality. Range or cattle grazing infrastructure such as fences and improvements can be destroyed and grazing may have to be deferred for several years.

The no action alternative, lacking forest health or fuels reduction treatments, fails to consider the need to protect adjacent land owners, protect the area from potential beetle infestations, promote the growth of declining aspen stands and, in general, work towards a healthier forest.