United States Department of Agriculture

# County Line Project

## Environmental Assessment

Forest Service | White River National Forest | Aspen-Sopris Ranger District | June 2019

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# Introduction

This environmental assessment was prepared to determine whether effects of the proposed activities may be significant enough to prepare an environmental impact statement. By preparing this environmental assessment, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. For more details of the proposed action, see the "Proposed Action and Alternative" section of this document.

## Location of the Proposed Project Area

The County Line Project is located within the Fourmile Creek, Camp Creek-East Divide Creek, Thompson Creek and Edgerton Creek-Crystal River watersheds located southwest of Glenwood Springs, Colorado, and west of Carbondale, Colorado. The project area encompasses approximately 33,300 acres of National Forest System lands and is characterized by a mosaic of forest intermixed with large natural openings (figure 1).

# Purpose and Need for the Proposal

The purpose of the proposed action is to:

- Improve forest resilience to potential future disturbances by maintaining or increasing forest age and size class diversity at the stand and landscape scale.
- Provide commercial forest products and / or biomass to local industries.
- Reintroduce fire to the landscape to improve wildlife habitat and reduce the area's susceptibility to large-scale, severe wildfire effects.
- Maintain or improve forest health conditions including stand resilience in forested areas located within permitted areas on the Sunlight Ski Area.
- Enhance recreation opportunities to improve safety, improve access and reduce user conflicts.
- Expand and develop an existing borrow source to provide rock material in support of road and facility maintenance and construction.

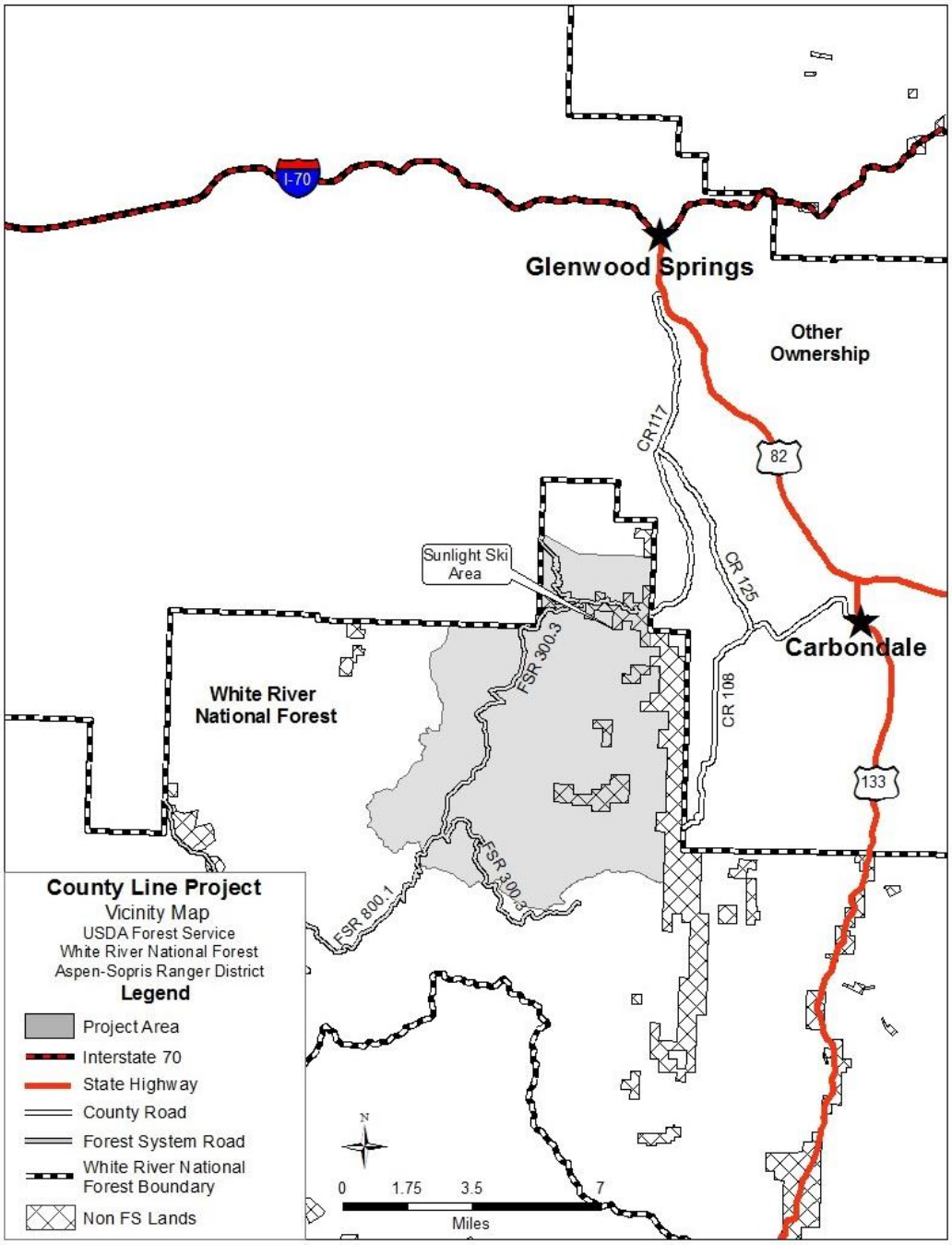


**Figure 1. Vicinity map[1]**

[1] All maps in this document are reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those for which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace, GIS products based on new inventories, new or revised information, and if necessary in conjunction with other Federal, state, or local public agencies or the public in general as required by policy or regulation. Previous recipients of the products may not be notified unless required by policy or regulation. For more information, contact the White River National Forest at (970) 945-2521.

The proposed action is needed because:

- Young aspen stands are under-represented across the landscape, while some mature stands are beginning to convert to Engelmann spruce and subalpine fir.
- Forest resiliency is lacking across the landscape due, in part, to the absence of age and size class diversity in both aspen and mixed conifer stands.
- Local and regional timber markets exist that rely on forest products.
- Natural disturbance processes have been and would continue to be suppressed in a landscape that was previously adapted to wildfire.
- Healthy stands of trees that retain forest cover over the long term are desirable to maintain a positive guest experience in recreation-based settings.
- Recreation opportunities, access, and public safety can be improved from the existing conditions.
- Development of local rock materials would better support present and continued road and facility maintenance.

# Proposed Action and Alternative

## No Action (Alternative 1)

The environmental assessment documents consideration of a no-action alternative through the effects analysis by contrasting the impacts of the proposed action and any alternative(s) with the current condition and expected future condition if the proposed action were not implemented (36 CFR 220.7(b)(2(ii). Under the no-action alternative, natural processes would continue and vegetation management, recreation enhancement, and fuels treatments would not occur. The area would continue to be used for recreation, personal use forest product gathering, hunting, and grazing.

## Proposed Action (Alternative 2)

The Aspen-Sopris Ranger District is proposing a variety of projects to meet the purpose and need. Proposed projects include:

- Forest health and vegetation management treatments on approximately 1,597 acres of National Forest System lands using traditional logging methods.
- Fuels management and wildlife habitat improvements on approximately 13,661 acres of National Forest System lands using prescribed fire treatments.
- Forest health assessment and treatments on approximately 2,390 acres of National Forest System lands within the Sunlight Ski Area Special Use Permit boundary.
- Fuel reduction treatments adjacent to existing infrastructure located at the Sunlight Communications site.
- Glading treatments on approximately 47 acres of National Forest System lands within the Sunlight Ski Area Special Use Permit boundary.

- Winter recreation improvements along National Forest System Road 300 including a parking area for winter non-motorized recreation use and construction of a snowmobile route.
- Moving the existing gate located at the kiosk on Road 300 to a location farther south along the road to improve access for Christmas tree collection.
- Expanding the existing borrow source located on Road 300 to provide rock material for use in maintenance and reconstruction of roads and other facilities located on National Forest System lands.

## I. Vegetation Management – Mechanized Harvest Treatments

Vegetation management activities are proposed on approximately 1,597 (± 10 percent) acres of forested land using coppice clearcut and group selection silvicultural methods (see table 1, figure 2, and figure 3).

**Table 1. Proposed vegetation management activities**

| Unit Number | Dominant Cover Type | Treatment Prescription | Acres (± 10%) | Management Area |
|---|---|---|---|---|
| 101 | Spruce – fir | Group Selection | 133 | 5.12 |
| 102 | Spruce – fir | Group Selection | 152 | 5.12 |
| 103 | Spruce – fir | Group Selection | 170 | 5.12 |
| 104 | Spruce – fir | Individual Tree Selection | 103 | 5.12 |
| 105 | Spruce – fir | Group Selection | 17 | 5.12 |
| 106 | Spruce – fir | Group Selection | 43 | 5.12 |
| 107 | Spruce – fir | Group Selection | 56 | 5.12 |
| 108 | Spruce – fir | Group Selection | 38 | 5.12 |
| 109 | Spruce – fir | Group Selection | 219 | 5.13 |
| 110 | Spruce – fir | Group Selection | 128 | 5.13, 5.4 |
| | | **Total Group /Individual Tree Selection Acres** | **1,059** | |
| 201 | Aspen | Coppice | 86 | 8.25 |
| 202 | Aspen | Coppice | 17 | 4.3, 5.12 |
| 203 | Aspen | Coppice | 36 | 4.3, 5.12 |
| 204 | Aspen | Coppice | 99 | 4.3, 5.12 |
| 205 | Aspen | Coppice | 26 | 4.3, 5.12 |
| 206 | Aspen | Coppice | 30 | 5.12 |
| 207 | Aspen | Coppice | 112 | 5.12 |
| 208 | Aspen | Coppice | 26 | 5.12 |
| 209 | Aspen | Coppice | 21 | 5.12 |
| 210 | Aspen | Coppice | 59 | 5.12 |
| 211 | Aspen | Coppice | 26 | 5.13 |
| | | **Total Coppice Acres** | **538** | |
| | | **Total Project Acres** | **1,597** | |

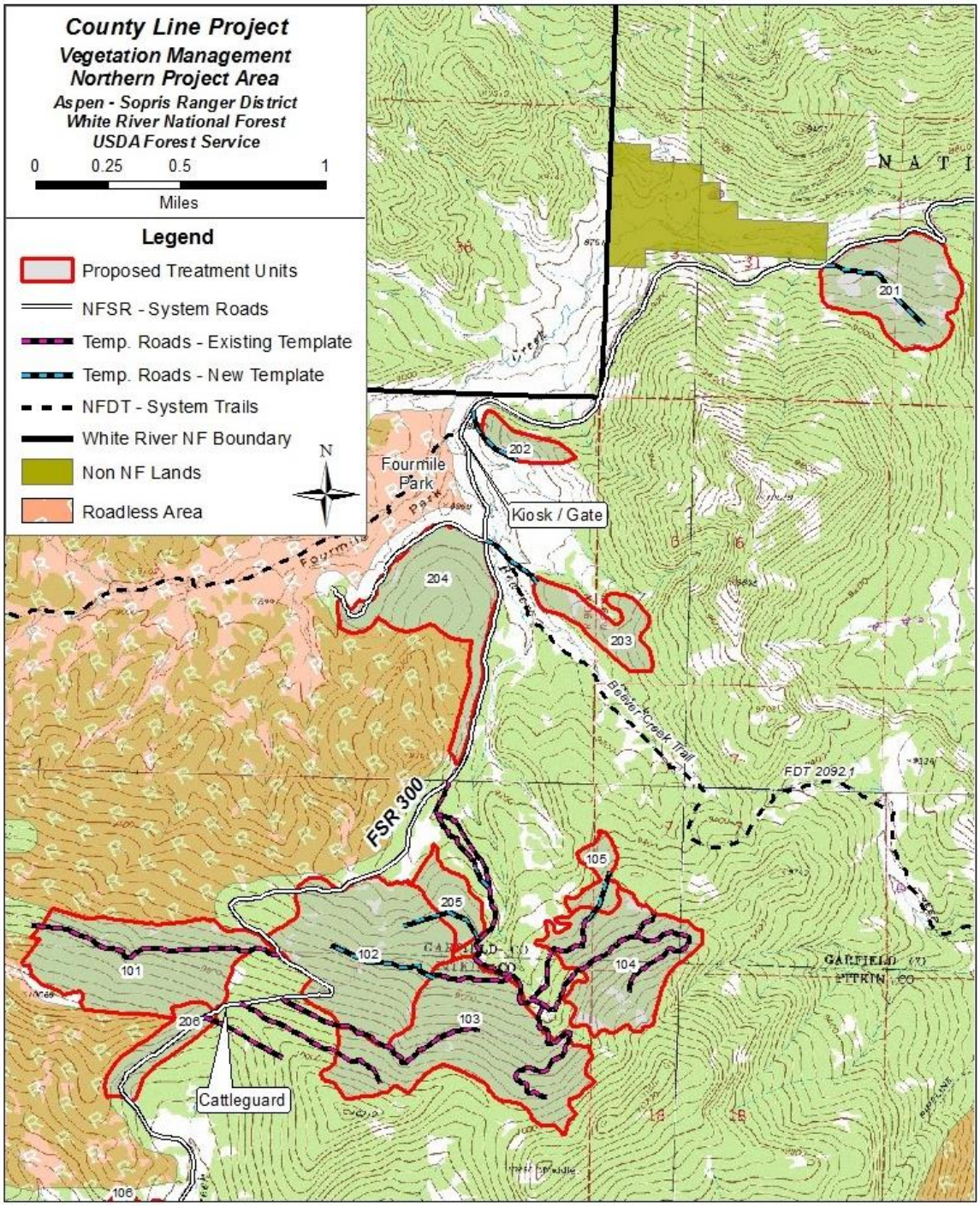


**Figure 2. Proposed vegetation management treatment areas (north)**

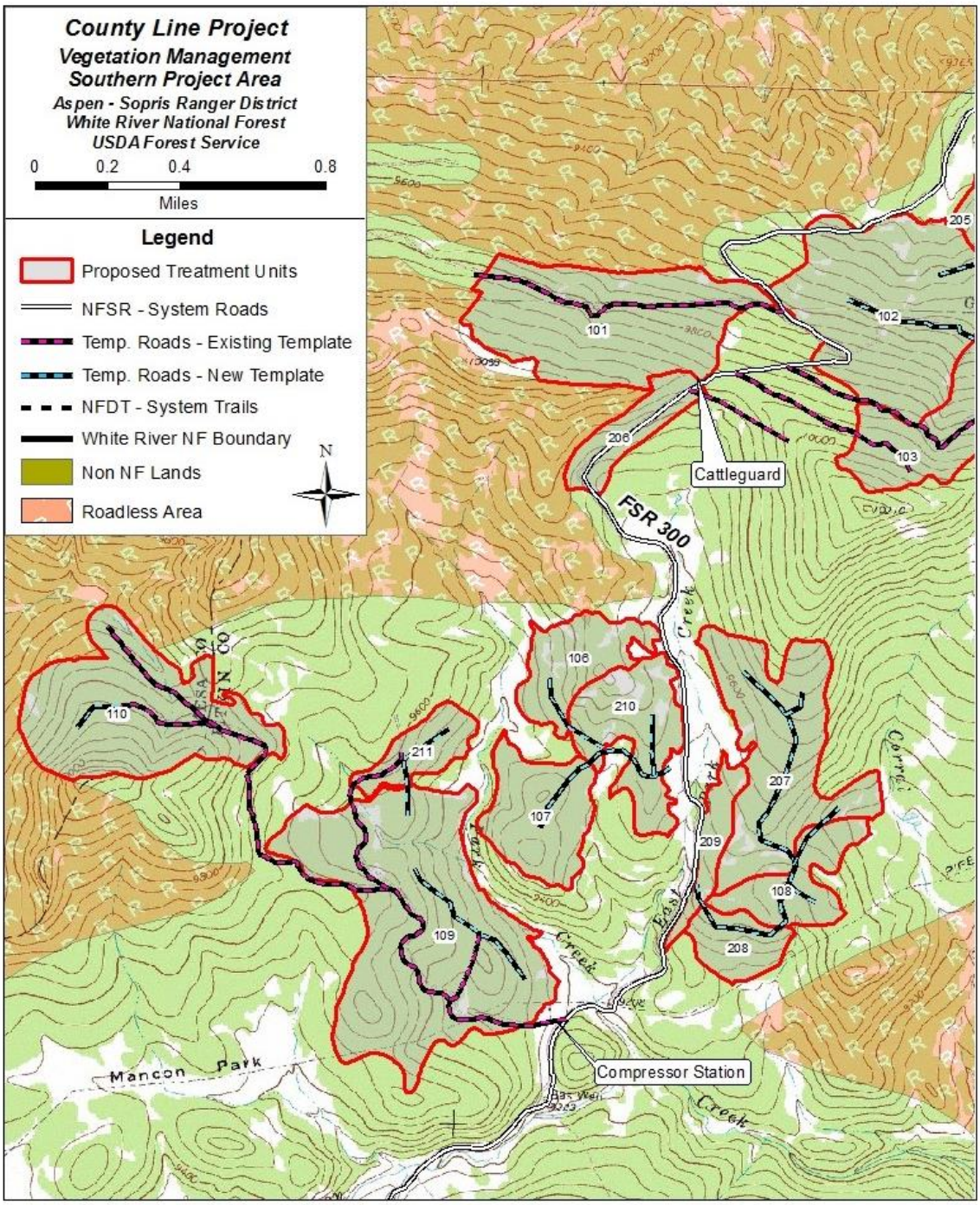


**Figure 3. Proposed vegetation management treatment areas (south)**

## Silvicultural Prescriptions

### *Group Selection and Individual Tree Selection*

Group selection and individual tree selection prescriptions are proposed in areas dominated by Engelmann spruce and subalpine fir. These prescriptions seek to initiate a new age class of trees while maintaining a mature overstory. In units identified to be treated using a group selection prescription, small openings 0.5 to 2 acres in size would be created by removing all trees larger than 5 inches diameter at breast height (DBH). Openings would be located at least two tree lengths from one another and would be dispersed throughout the proposed treatment areas. Cumulatively, group openings would not exceed 20 percent of a unit's total size.

In units proposed to be treated using an individual tree selection prescription individual trees would be removed to provide favorable conditions for establishing a new age class. Subalpine fir and Engelmann spruce with poor form would be favored for removal. Tree removal would not exceed 30 percent of the total basal area of the stand.

### *Coppice*

A coppice prescription is proposed in areas dominated by aspen. Treatment areas were identified across the project area where aspen clones are mature and are generally experiencing declining tree vigor. In units identified to be treated using a coppice prescription, all trees larger than 2 inches DBH would be removed. Treated areas would be expected to regenerate as aspen via root suckering, creating a new age class of aspen.

## Implementation Methods

Units with proposed coppice cuts, group selection harvests and individual tree selection harvests would use conventional ground based equipment to harvest and remove trees. Conventional equipment typically includes rubber-tired or track skidders, and rubber-tired or track-mechanized harvesters. Logging activities (cutting, felling, yarding, temporary road construction and obliteration, road maintenance and road reconstruction) may occur year-round as weather and ground conditions allow.

Small commercial or personal use sales may be used in part to provide special accomplish treatment objectives. Slash piles and non-merchantable material may be burned and/or removed for biomass utilization.

## Transportation

The proposed action would use National Forest System (NFS) roads, county roads, and temporary roads to provide access to proposed treatment areas. Newly constructed temporary roads would be closed to motor vehicle traffic or obliterated following treatment activities.

### Associated Activities

Other proposed activities associated with project implementation include mechanical site preparation, regeneration surveys, and fill-in planting. Mechanical site preparation may include using a piece of tracked equipment that disturbs existing vegetation, exposing areas of bare mineral soil. Bare mineral soil exposure would provide favorable conditions for the establishment of Engelmann spruce and aspen seedlings, and would decrease competition between establishing seedlings and other vegetation. Mechanical site preparation would be expected to occur after harvesting activities are complete, but before the start of the first growing season as ground conditions allow. Mechanical site preparation would not occur on every acre, but rather in areas where competing vegetation such as grass or carex could impede tree establishment. Regeneration surveys would be conducted in harvest units in the first, third, and fifth years after all harvest activities are complete. Fill-in planting with Engelmann spruce may occur within group selection units if surveys indicate that natural regeneration is below forest plan standards (Forest Plan p. 2-12)

## II. Sunlight Ski Area Forest Health

The proposed action includes vegetation management activities on approximately 2,390 acres of forested lands located within the Sunlight Ski Area Special Use Permit boundary (figure 4). Treatments would be designed to meet desired forest health conditions. Treatments are not expected to occur on every acre, and it is anticipated 0 to 20 acres would be treated annually.

Proposed treatments include:

- Removing hazard trees to minimize risk of falling trees to the public and resort infrastructure.
- Removing hazard trees as a sanitation or salvage treatment where appropriate, for instance within a designated buffer zone from the edge of a ski run or lift corridor.
- Planting seedlings or transplants to speed up regrowth in key areas.
- Reducing the likelihood of bark beetle attacks (affecting pine, spruce, or Douglas-fir species) by applying an approved insecticide or anti-aggregative pheromone prior to beetle emergence each year until the threat of infestation is over. Insecticide would be applied to trees around structures and selected high-value tree islands. In other high-value areas, prevention (or reducing the rate of spread) could include treating beetle-infested trees by felling and peeling, burning, chipping, or removing the trees prior to beetle emergence.
- Implementing measures to protect treated areas and newly established regeneration from skier damage. Where treatments occur in individual tree islands smaller than 0.5 acre, regeneration may not be required unless trees contribute to resort management functions of trail delineation or wind protection.
- Burning or removing logging-generated slash to reduce ground fuels and to stimulate aspen regeneration. Slash treatments may include chipping and scattering slash.

The majority (92 percent) of the ski area is composed of aspen stands or aspen stands mixed with conifer species. The remainder of the forested area is composed of spruce and fir stands. The Forest Service has developed a range of silvicultural prescription options that could be implemented within each of the major stand types.

The following stand types were identified within the Sunlight Ski Area permit boundary:

**Stand Type 1**: Stand fragments or individual tree islands
These areas are typically too small to be labeled as individual stands and they usually occur within existing ski trails. Various trees species are present within these areas including Engelmann spruce, subalpine fir, blue spruce, Douglas-fir, and aspen.

**Stand Type 2**: Pure aspen and aspen mixed with other tree species (less than 30 percent)
These stands are predominately even-aged aspen with patches or scattered individuals of other tree species that comprise less than 30 percent of the total basal area of the stand. Other tree species that may be present include subalpine fir, Engelmann spruce, Douglas-fir, or Rocky Mountain maple.

**Stand Type 3**: Mixed conifer – Engelmann spruce and subalpine fir
These stands are composed of a mix of Engelmann spruce and subalpine fir. Some stands contain an aspen component (less than 30 percent). Other conifer species may exist within stands including Douglas-fir or blue spruce. Stands can be even-aged or uneven-aged with well-developed understories.

**Stand Type 4**: Mixed conifer with aspen
These stands are composed of a near equal mix of aspen and Engelmann spruce-subalpine fir. Other conifer species may exist within stands including Douglas-fir or blue spruce. Aspen or conifer species typically occur in groups or clumps and may be even-aged, two-aged, or uneven-aged.

## Silvicultural Prescriptions / Vegetation Treatment Options

The following silvicultural prescriptions or treatment options could occur in the identified stand types located within the Sunlight Ski Area permit boundary.

### *Stand Type 1: Stand fragments or individual tree islands*

***Treatment Option 1.1 – Insecticide or Pheromone Application and Treating Infested Trees (Preventative Action):*** High-value trees would be treated by applying an approved insecticide or an approved anti-aggregation pheromone prior to beetle emergence each year until the threat of infestation is over. In high-value areas beetle-infested trees would be treated by felling and peeling, burning, chipping, or removing the trees prior to beetle emergence.

***Treatment Option 1.2 – Hazard Tree Removal*:** Hazard trees located within a buffer zone that does not exceed 110% of the tallest tree within the stand would be harvested and all other trees would be retained.

***Treatment Option 1.3 – Plant Seedlings or Transplants (Regeneration):*** Trees would be planted in understocked areas where protection from skier or rider damage and shelter from the harsh elements could be provided. Planting stock could either be nursery-grown or transplanted from adjoining areas with sufficient seedling and sapling stock. Protection could be provided by fencing or other deterrents.

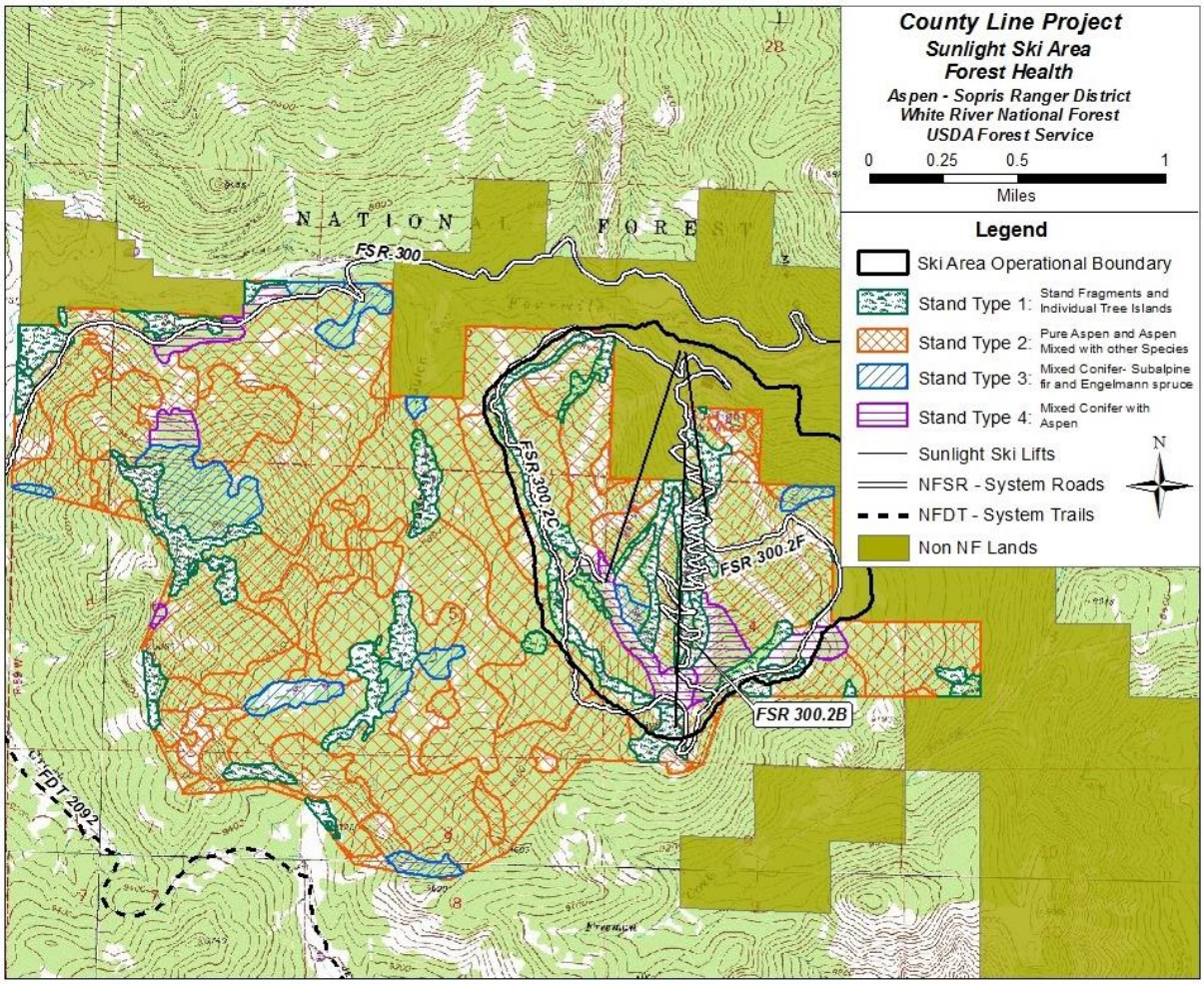


**Figure 4. Sunlight Ski Area forest health**

*Stand Type 2: Pure aspen and aspen mixed with other tree species (less than 30 percent).*

***Treatment Option 2.1 – Hazard Tree Removal***: Hazard trees located within a buffer zone that does not exceed 110% of the tallest tree within the stand would be harvested and all other trees would be retained.

***Treatment Option 2.2 – Salvage Harvest***: All dead trees within a stand would be harvested up to 30 percent of the basal area of the stand, and all other trees would be retained.

***Treatment Option 2.3 – Regeneration Harvest***: Live and dead trees would be harvested in identified areas where aspen regeneration is the priority. Within the existing developed portion of the permit area, openings are expected to be small, typically not exceeding 5 acres. Outside the developed ski area, but still within the permit boundary, openings may be up to 40 acres in size. Note that unit 201 within the vegetation management proposal is within the ski area permit boundary and is approximately 86 acres in size. The larger proposed opening will be analyzed in the vegetation management section of the proposed action and is not part of the Sunlight Ski Area Forest Health proposal.

### Stand Type 3: Mixed conifer - Engelmann spruce and subalpine fir

***Treatment Option 3.1 – Hazard Tree Removal*:** Hazard trees located within a buffer zone that does not exceed 110% of the tallest tree within the stand would be harvested and all other trees would be retained.

***Treatment Option 3.2 – Insecticide or Pheromone Application and Treating Infested Trees (Preventative Action):*** High-value trees would be treated by applying an approved insecticide or an approved anti-aggregation pheromone prior to beetle emergence each year until the threat of infestation is over. In high-value areas, beetle-infested trees would be treated by felling and peeling, burning, chipping or removing the trees prior to beetle emergence.

### Stand Type 4: Mixed conifer with aspen

***Treatment Type 4.1 – Hazard Tree Removal***: Hazard trees located within a buffer zone that does not exceed 110% of the tallest tree within the stand would be harvested and all other trees would be retained.

***Treatment Type 4.2 – Insecticide or Pheromone Application and Treating Infested Trees (Preventative Action):*** High-value trees would be treated by applying an approved insecticide or an approved anti-aggregation pheromone prior to beetle emergence each year until the threat of infestation is over. In high-value areas, beetle-infested trees would be treated by felling and peeling, burning, chipping, or removing the trees prior to beetle emergence.

***Treatment Type 4.3 – Salvage Harvest***: All dead trees within a stand would be harvested up to 30 percent of the basal area of the stand, and all other trees would be retained.

***Treatment Type 4.4 – Regeneration Harvest*:** Live and dead trees would be harvested in identified areas where aspen or spruce and fir regeneration is the priority. Within the existing developed portion of the permit area where aspen regeneration is desired, openings are expected to be small, typically not exceeding 5 acres. Outside the developed ski area, but still within the permit boundary, openings that emphasize aspen regeneration may be up to 40 acres in size. Within the ski area permit boundary, openings that emphasize spruce and fir regeneration would not exceed 2 acres in size.

## Implementation Methods

### Mechanical Felling

Mechanical felling would use ground-based machinery to harvest trees and remove them from the stand. Conventional logging equipment typically includes harvesters, rubber-tired and tracked skidders, stroke de-limbers, chip vans, and log trucks. Trees could be processed (limbed and cut to length) in the forest or at a landing, provided all design features for fuel loading and coarse woody retention are adhered to. Mechanical equipment would not be used on slopes greater than 40 percent, except as described below. Mechanical equipment may be used over the snow.

### Hand Felling with Limited Mechanical Felling

In areas with slopes greater than 40 percent or wetland areas or where access by mechanical means is not possible, other methods may be used such as hand felling, over-the-snow skidding, helicopter yarding, cable yarding, or burning on-site. Hand felling would use chainsaw crews to fell trees. In most areas, trees would be felled so that the boles of trees lie directly on the surface of the ground to enhance decomposition. Limbs and some tree boles would be piled and burned

or chipped to reduce flashy fuel accumulations. In some cases, trees may be winched out of the stand, cable yarded, or helicopter yarded. In these units, a small amount of ground-based machinery may be used to treat vegetation if a site visit indicates that doing so would not be contradictory to design features established in this analysis.

## III. Fire and Fuels (Prescribed Fire and other Fuels Treatments)

Areas proposed to be treated with prescribed fire contain a variety of vegetation types including aspen, grass, and brush/shrub species (figure 5). In many of these areas, the vegetation is classified as condition class 2, meaning that the vegetation is moderately altered from the historical range of variation and typically one or more historic fire return intervals have been missed. Prescribed fire can be used as a tool to reintroduce fire back into an area. Prescribed fire treatments can reduce hazardous fuel accumulations, thereby, reducing the risk to life, property, and natural resources. These treatments would promote regeneration of both aspen and mountain brush species, which would greatly benefit wildlife. Prescribed fire is proposed in the areas shown in table 2.

**Table 2. Proposed prescribed fire treatment areas**

| Name | Acres | Target Species for Prescribed Fire |
|---|---|---|
| Sunlight Aspen | 1,428 | Aspen, Shrubland |
| Fourmile Park | 672 | Aspen, Grass/Forb, Shrubland |
| Beaver Creek Aspen | 2,355 | Aspen, Grass/Forb, Shrubland |
| North Thompson | 4,469 | Aspen, Grass/Forb, Shrubland |
| Park Creek | 1,026 | Aspen, Shrubland |
| Baylor Park | 2,082 | Aspen, Grass/Forb, Activity Slash |
| Middle Thompson | 1,629 | Aspen, Grass/Forb, Shrubland |
| **Total** | **13,661** | |

All fire treatments would follow prescribed burn plans developed for site-specific environmental and human resources. Before setting fires, crews would establish control lines as needed to manage its spread. Crews would construct fire lines by hand, and no heavy equipment would be used for line construction. Natural barriers, existing firebreaks, and wet lines may be used where appropriate. Existing roads, trails, and snow cover are often effective firebreaks. Prescribed fire units would be broadcast burned in spring or fall either by hand or using aerial ignition methods.

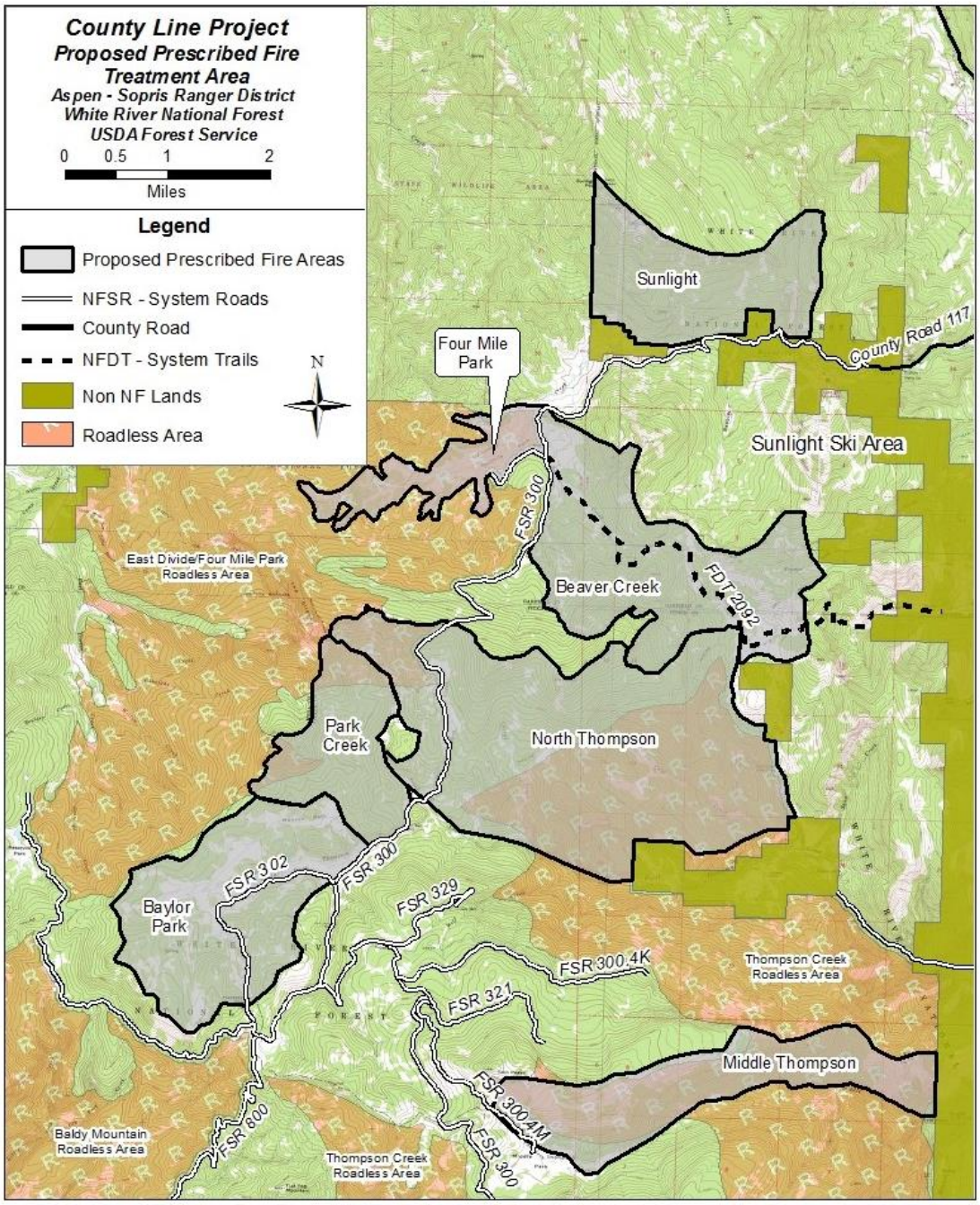


**Figure 5. Proposed prescribed fire areas**

At the Sunlight communications site, allow permittees to reduce fuel loading adjacent to existing communication infrastructure (figure 6). Treatments include hand thinning stands and limbing residual trees within 300 feet of existing infrastructure. Thinning treatments would remove live and dead trees and existing downed fuels. Treated fuels would be piled and burned or chipped.

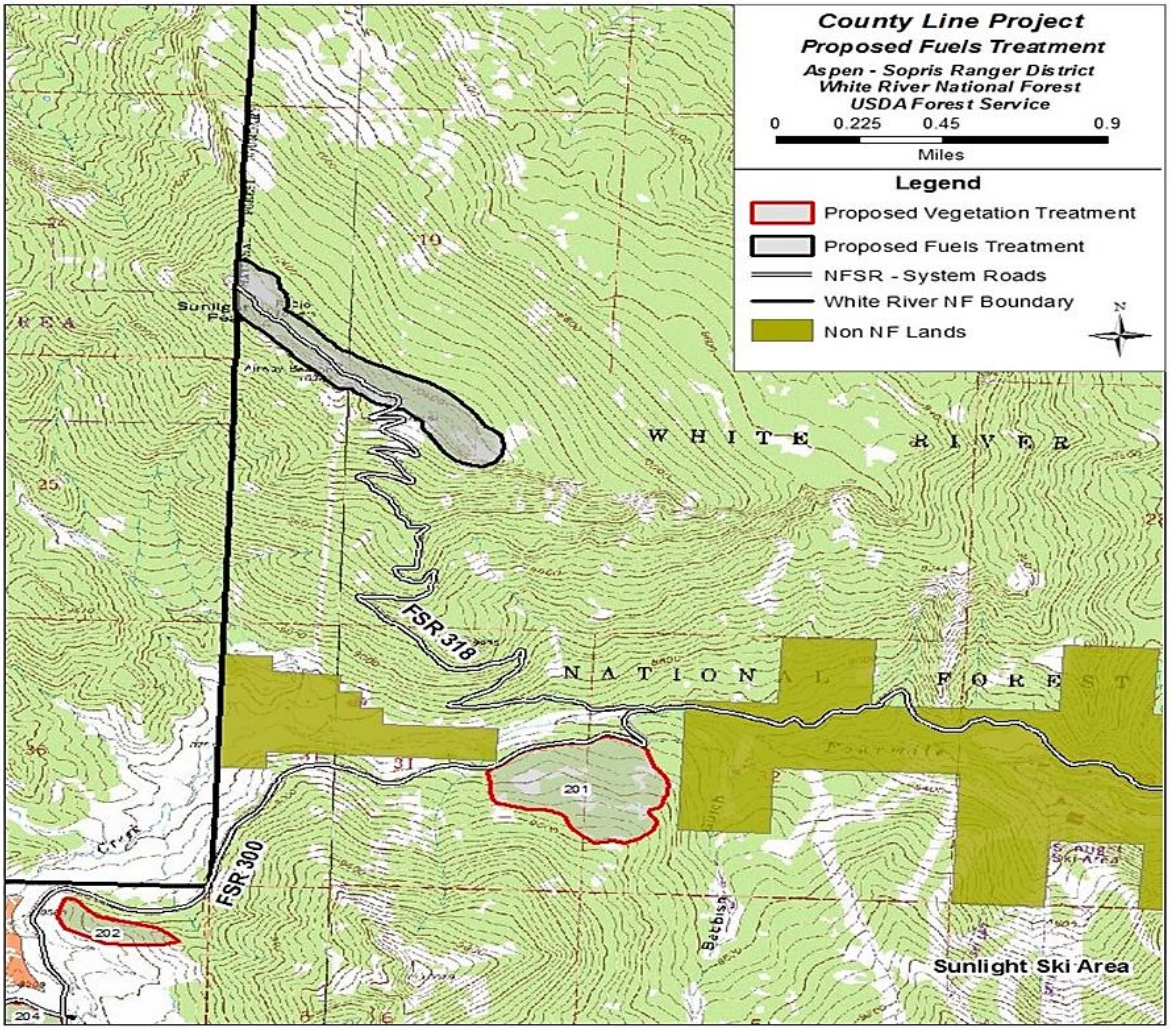


**Figure 6. Sunlight communications site**

## IV. Recreation Enhancements

The following projects were brought forward by resource specialists to enhance recreational opportunities, reduce conflicts between user groups, and to provide for public safety.

- Construct a parking area for winter non-motorized users of NFS Road 300. The parking area would accommodate approximately 10 vehicles (figure 7). Currently, non-motorized users park along Road 300, just below the cattle guard. Snowmobilers park farther down Road 300 in a parking lot more suitable for snowmobile trailers.
- Create a snowmobile route approximately 0.36 mile long that would reduce conflicts between non-motorized and motorized winter users along Road 300 at the cattle guard. This route would separate use for a short period, allowing users to disperse before coming back together on the road. Non-motorized users (backcountry skiers) typically use the area as access to Williams Peak, so they are not on Road 300 for very long.

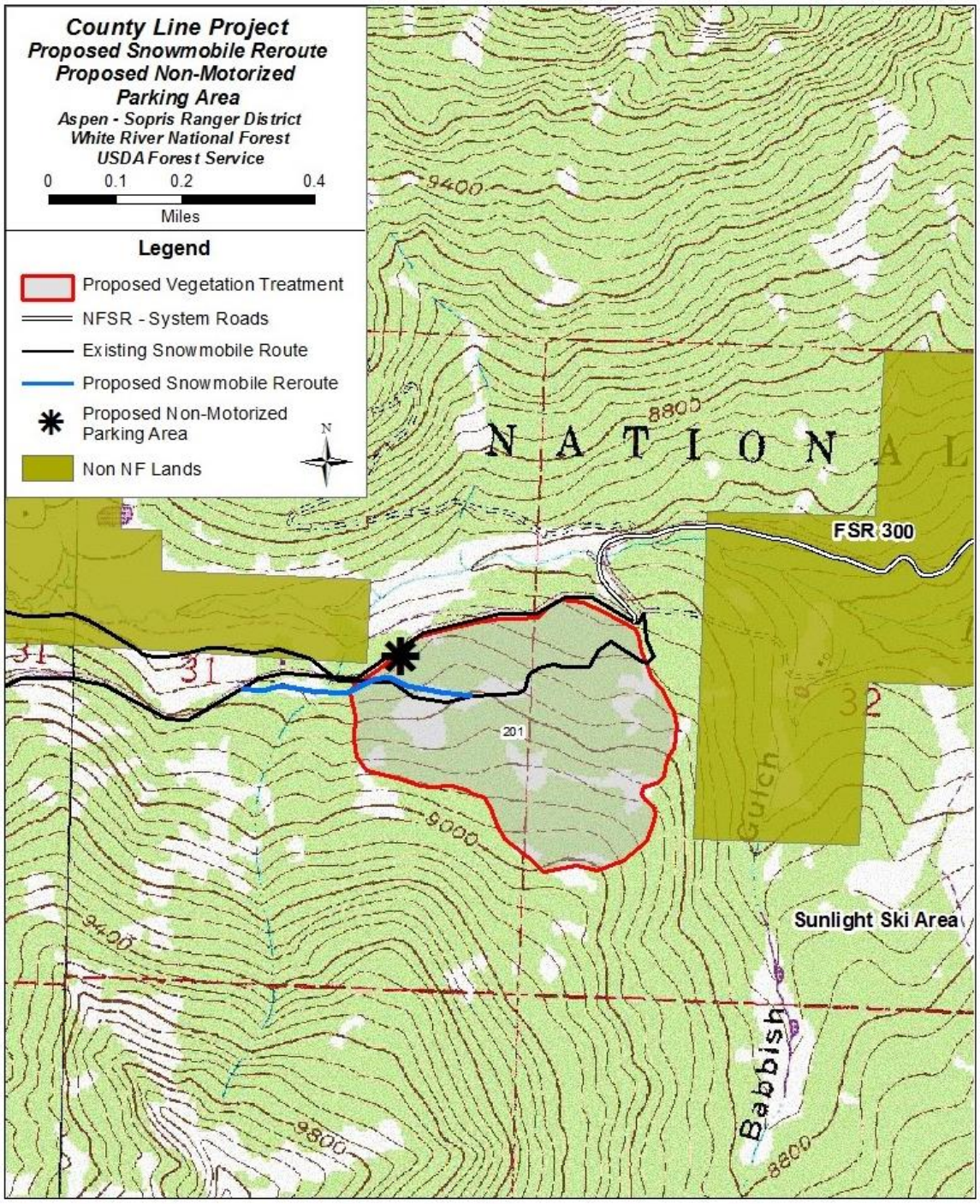


**Figure 7. Proposed parking area and snowmobile route**

- Increase opportunities for gladed skiing and snowboarding at Sunlight Ski Area. Ski Sunlight has identified 47 acres for tree glading within the existing permit boundary. Glading treatments would remove up to 30 percent of the basal area within the stand. Trees that are cut would either be removed from the site or piled and burned by the ski area.

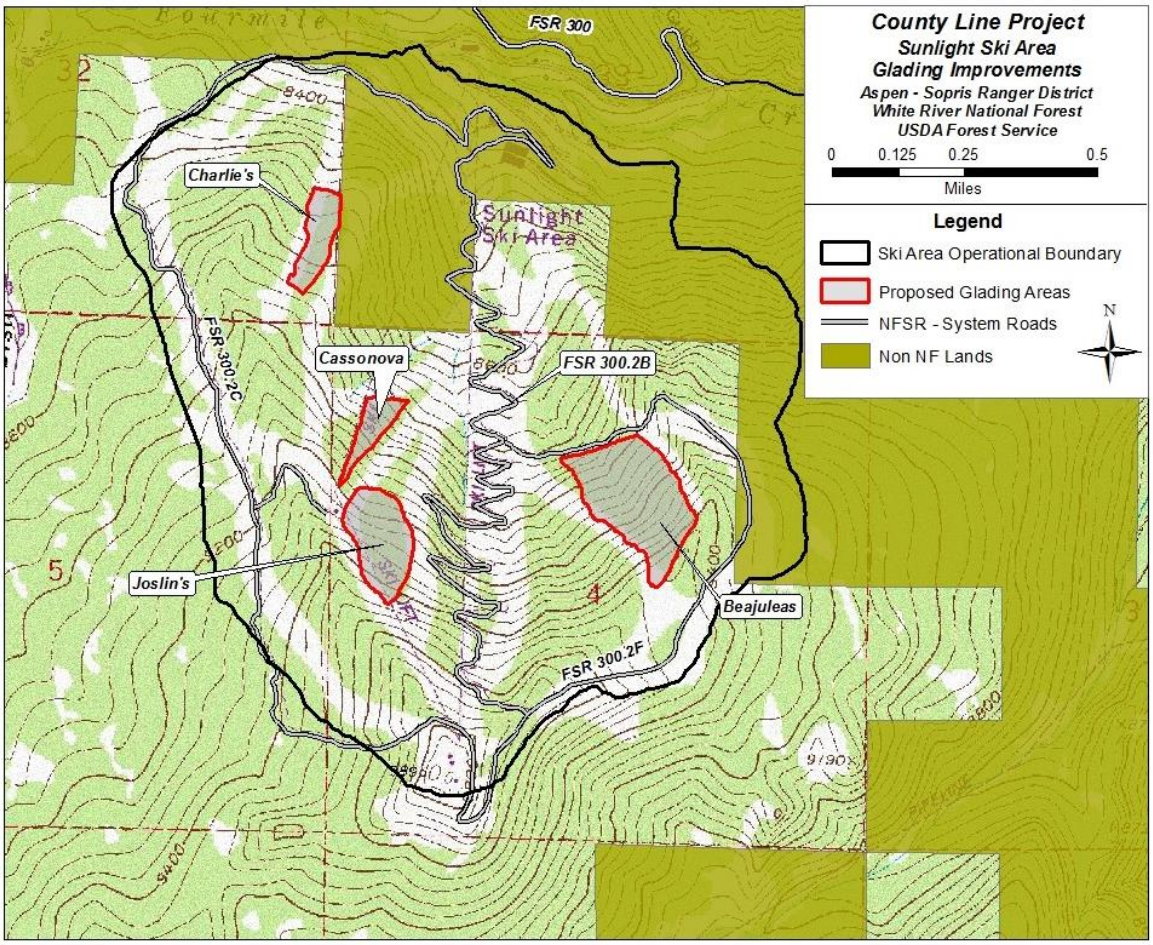


**Figure 8. Proposed glading on Sunlight Ski Area**

- Allow wheeled vehicle traffic farther south on Road 300 to provide an opportunity for increased access to Christmas tree collection areas. The existing gate at the Road 300 kiosk would be relocated approximately 1.5 to 2 miles south on Road 300. The exact gate location would be determined based on existing topography adjacent to the road surface. The gate would be closed on November 23, in accordance with the White River National Forest Travel Management Plan (see figure 9).

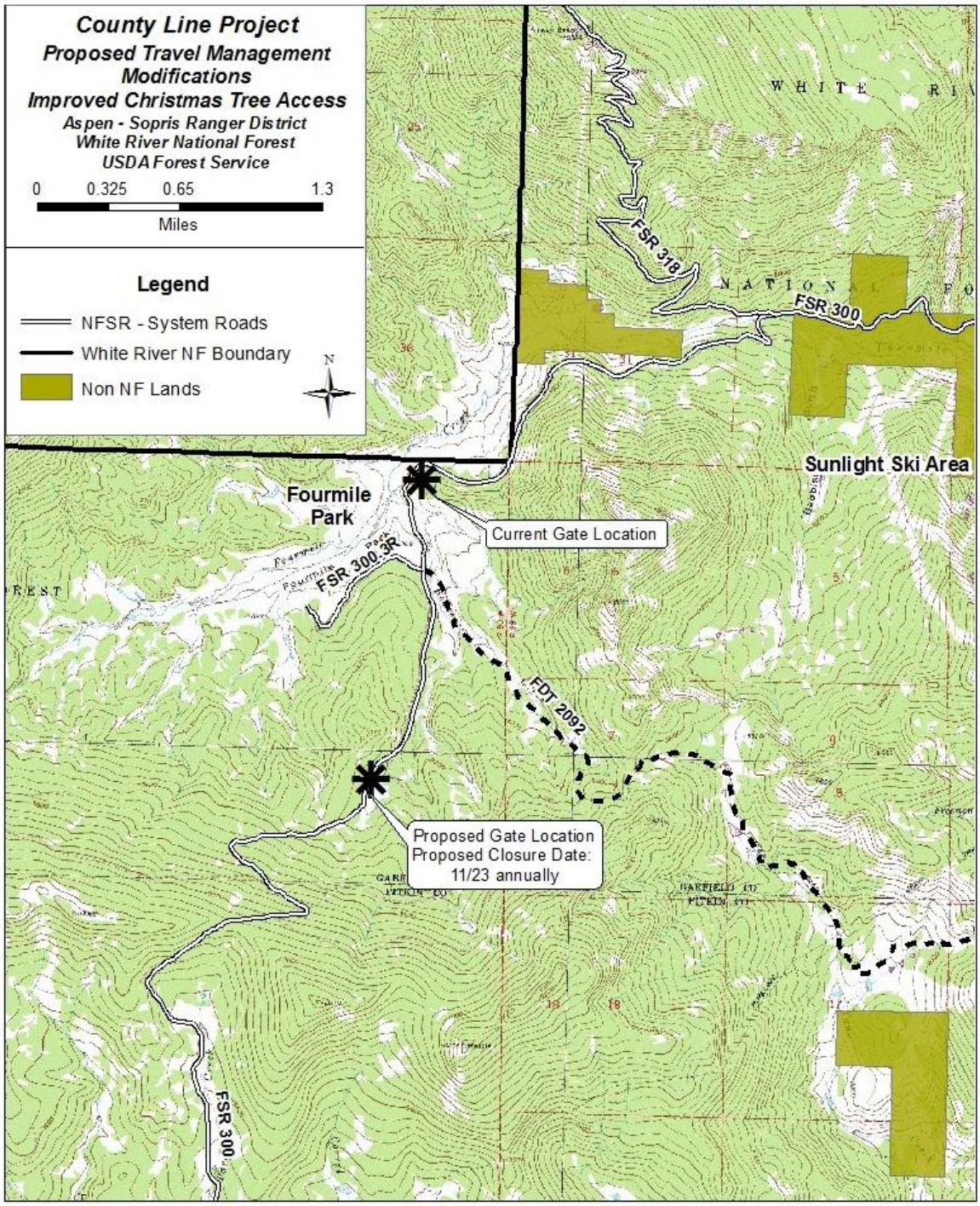


**Figure 9. Proposed gate location**

## V. Expansion of County Line Borrow Source

Expansion of the developed area of the County Line Borrow Source would allow further production of rock material for use in maintenance and reconstruction of roads and other facilities. Subsurface investigation by drilling or other means would be used to assess the quality and volume of material available for long-term needs. It is anticipated that approximately

30,000 cubic yards may be excavated and removed over a period of 10 to 20 years. The site would also be used to store stockpiled material for use as needed. The area of surface disturbance would increase from the existing approximate 1.5 acres to approximately 4.6 acres. Vegetation removal would include grass, shrubs, and some standing timber. Access to the borrow source is directly from Fourmile Road 300.3. The existing gate would remain in place to control vehicular access.

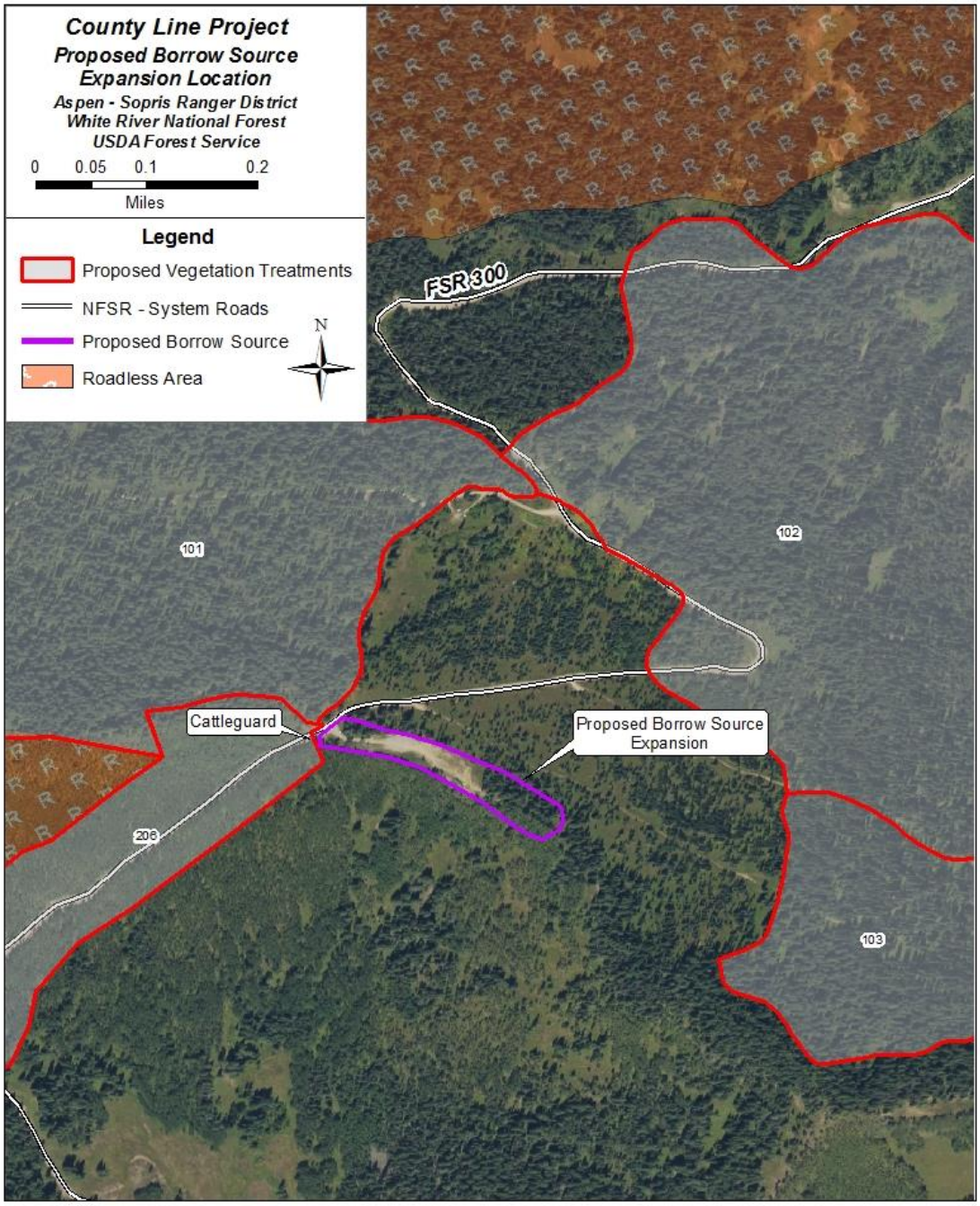


**Figure 10. Borrow source location**

# Potential Sale Area Improvement Projects

As authorized in the Knutson-Vandenberg Act of 1930 (KV), a portion of the timber receipts generated from proposed commercial timber harvests may be deposited into a cooperative account for future use in improving existing structures and renewable natural resources within timber sale boundaries. Projects proposed by the interdisciplinary team are listed in Table 3 in order of funding priority. These projects would be included in a Sale Area Improvement Plan, which is required to receive and disperse KV funds and are a part of the Proposed Action. Required reforestation KV projects would be funded by base timber rates. All other KV projects may occur if timber sales produce sufficient revenue. Proposed improvements may also be implemented utilizing other appropriated funds.

**Table 3. Proposed sale area improvement projects**

| |
|---|
| 1. Regeneration Surveys – 1st, 3rd, and 5th year (All coppice clearcut and group selection openings) |
| 2. Site preparation for natural regeneration. Includes measures to protect aspen regeneration. |
| 3. Artificial reforestation (fill-in planting) |
| 4. Cone collection |
| 5. Invasive weed treatments* |

*This document tiers to the "Forestwide Weed Treatment EA" and incorporates the August 30, 2007 Decision Notice that would cover the weed treatments included in any KV plans associated with the County Line Project.

# Environmental Impacts of the Proposed Action and Alternative

The project area contains several cover-types including aspen, mixed conifer, grass, and shrublands. Within these stands, species composition can be varied with some areas growing in pure stands while others contain a mix of species. Within the aspen cover-type, there is a lack of age class diversity with the majority of the stands containing mature trees. There is a minor amount of natural regeneration occurring in some stands; however, growth rates are hindered and mortality rates are high due to grazing and foraging pressure from cattle and wildlife. In other parts of the project area, mature aspen are beginning to show signs of decline, possibly due to drought or climate change. The mixed conifer cover-type (Engelmann spruce – subalpine fir) experienced low to moderate mortality rates due to a spruce beetle outbreak in the late 1990s. Currently, the western spruce budworm is having the largest impact in the project area. This insect is defoliating spruce and fir trees in the area. Understory trees are more susceptible to the defoliation, which can result in mortality in individuals and small groups.

The landscape supports a variety of motorized and non-motorized recreation including camping, hunting, hiking, snowmobiling, and cross-country skiing. Other uses of the area include natural gas development, communications sites, grazing, commercial timber harvest, and a developed downhill ski area.

This section summarizes the potential impacts of the proposed action and alternative.

# Botany and Noxious Weeds

## Resource Description

This section analyzes how the proposed project would affect threatened, endangered, and sensitive plants and noxious weeds.

### Threatened, Endangered, and Sensitive Plants

Effects to threatened, endangered and sensitive plants are evaluated based on known presence of occurrences and suitable habitats, and the expected responses of each species to the proposed activities. Factors that may be considered in the analysis of effects include: the proportion of the species' total population and range that is in the analysis area or is affected by the action; whether the habitat affected by the action is necessary for critical life functions; timing, frequency and duration of human activity; any anticipated reductions in numbers or distribution of the species; and the potential of the species to recover from impacts.

Threatened, endangered and sensitive plant occurrences were overlain with the areas of proposed activity using a geographic information system (GIS) and evaluated for their various habitats and likely responses to determine areas of potentially significant effects.

The biological evaluation/biological assessment reviews the proposed activities in sufficient detail to determine the level of effect that would occur to federally listed plants and Region 2 Sensitive plant species. One of three possible determinations is chosen based on the available literature, a thorough analysis of the potential effects of the project, and the professional judgment of the botanist who completed the evaluation. The three possible determinations (from FSM 2672.42) are:

- No impact
- May affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area
- May affect individuals, and is likely to result in a trend toward Federal listing or loss of viability in the planning area

Similar categories for federally listed threatened and endangered species are:

- No effect
- May affect, not likely to adversely affect
- May affect, likely to adversely affect

### Non-Native Invasive Plants

The general term "weeds" is used to include listed noxious weeds and other non-native invasive plants. A risk category of low, moderate, or high is the result of a qualitative analysis.

## Direct and Indirect Effects

### Alternative 1 – No Action

The analysis of the no action alternative provides reviewers a baseline to compare the effects of proposed actions and the potential long-term impacts from not implementing the actions. Under

the no action alternative, the proposed actions described in alternative 2 would not take place, resulting in no direct or indirect effects. Because there would be no direct or indirect effects, no cumulative effects would occur.

Alternative 1 would have **no impact** to any Region 2 sensitive plant species.

## Alternative 2 – Proposed Action

### Threatened, Endangered, and Sensitive Plants

Direct effects occur at the same time and place as the action causing the effect. Direct impacts may include breaking, crushing, or uprooting sensitive plants from contact by equipment, materials, or personnel. Individual plants or populations may be covered by slash, chips, or soil, or crushed by fallen trees, potentially damaging the plants or interrupting photosynthesis and reproduction processes. Individuals or populations could also be burned by prescribed fire.

Indirect effects occur at a later time or in a different location as the action causing the effect. Examples of indirect effects include changes in microclimate conditions such as increased light or reduced moisture caused by canopy thinning or removal, the introduction of invasive plants and subsequent changes in plant communities and competition, or increased erosion caused by bare, disturbed soil. The proposed action could indirectly impact sensitive plants through the following processes:

- Causing changes in vegetation composition and cover
- Changing local hydrologic functions in plant habitat
- Changing soil characteristics and erosion potential
- Introducing and creating habitat for invasive plants
- Impacting pollinators or mycorrhizal fungi associated with sensitive plants

If present, individual sensitive plants may be damaged or killed by the felling of trees, and associated trampling of vegetation by project personnel. Equipment may also damage sensitive plants during road maintenance activities and the creation and/or use of landings. Pile burning may scorch or consume sensitive plants. These direct effects could result in the loss of individuals or small occurrences if they are present and undetected. Because their habitats may be present within areas of proposed activities, direct effects are possible for *Botrychium ascendens*, *Cypripedium parviflorum*, and *Rubus arcticus* ssp. *acaulis*. Due to the limited area of activity, continued existence of known occurrences throughout their ranges, and future protection of sensitive plant occurrences if they are found, these direct effects would not likely result in loss of viability or a trend toward Federal listing for these plants.

All of the actions listed above involve ground disturbance and/or changes to vegetation structure. All of the actions have potential to impact *Botrychium ascendens*, *Cypripedium parviflorum*, or *Rubus arcticus* ssp. *acaulis* or their habitats where they might occur. Pre-disturbance surveys would identify any areas of concern to be protected. If occurrences are found, appropriate management actions would be developed; for instance, a population may be experiencing too much shading, and the proposed actions would benefit the rare plant population, but would need to be implemented using cautionary measures at the site. If the proposed action would provide a benefit to an occurrence, the action would be allowed to proceed, likely with some cautionary measures, but otherwise, disturbance to occurrences would be avoided.

Soil disturbance and movement of vehicles and personnel in the area may also provide opportunity for invasive plant species to become established or spread within the analysis area. If invasive plants become established within occupied habitat, individuals or whole populations of sensitive plants could be lost as a result of the change in plant community and resulting competition for resources. With project design features specifying treatment and monitoring of weeds as well as requiring weed-free equipment, the risk of increased weed infestations is reduced. Soil disturbances may also negatively affect the soil biota, including mycorrhizal fungi needed for the successful germination and establishment of new *Botrychium* and *Cypripedium* plants. The magnitude of effect to the soil biota is not expected to be enough to prevent the possible establishment of new sensitive plants.

Piling and burning slash material has localized negative effects to the vegetation and soils. Fire would be concentrated in small locations for an extended time. Vegetation would be scorched or consumed, and soil properties would be altered, resulting in bare patches of exposed, often hydrophobic soils. Invasive plant species can easily colonize these sites if given the opportunity. The exposed soil may also provide suitable conditions for *Botrychium* species to become established (Zika 2005).

### Non-Native Invasive Plants

Nine weed species are present in the areas proposed for activity, including treatment units and access roads. To prevent undesirable effects to several resources, project design features would be implemented. Weeds would receive control treatments before the project activities begin. Monitoring and additional control treatments would occur after project activities are completed. Reasonable measures, including equipment washing, would be taken to ensure that any road construction or maintenance equipment brought into the project area would be free of weed seeds or propagules. These measures would significantly reduce the risk of introducing or spreading weed infestations due to project activities.

## Cumulative Effects

When the effects of ongoing and future expected activities are combined with the expected effects of the current proposal, botanical resources would still be protected from significant damage and no trend toward Federal listing would occur.

## Summary of Effects

### Threatened, Endangered, and Sensitive Plants

No threatened, endangered, or sensitive plants are known to be present in the County Line project area. No threatened or endangered plants are suspected of occurring in the project area, therefore none would be affected.

Within the project area, habitat may be present for the following Region 2 sensitive plants:

- *Botrychium ascendens*
- *Cypripedium parviflorum*
- *Rubus arcticus* ssp. *acaulis*

Due to vegetation and soil disturbances and the possibility of increased weed infestations, these plants and their habitats may be impacted by the proposed action, but it would not likely result in

a loss of viability in the planning area, nor cause a trend toward Federal listing. Effects include the possibility of direct damage to undiscovered occurrences as well as the possibility of habitats being maintained or created by the disturbance (for *Botrychium ascendens* and *Cypripedium parviflorum*). Even though design features would reduce the risk of increased weed infestation to a moderate level, there is the possibility that some increases in weeds could occur and may affect any Region 2 sensitive plant habitats present. All other sensitive plants would be unaffected by the proposed action because their habitats are not present.

**Error! Reference source not found.** summarizes biological determinations by alternative for the hree sensitive plant species that were carried forward in this analysis.

**Table 4. Summary of determinations for threatened, endangered, or sensitive plants**

| Species | Alternative 1<br>No Action | Alternative 2<br>Proposed Action |
|---|---|---|
| *Botrychium ascendens* | No Impact | MAII* |
| *Cypripedium parviflorum* | No Impact | MAII* |
| *Rubus arcticus* ssp. *acaulis* | No Impact | MAII* |

* Assuming presence, 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.

### Non-Native Invasive Plants

The proposed project carries an overall moderate risk of spreading or introducing noxious weeds. Contributing to this risk is that fact that weeds are already present, habitat is vulnerable to invasion, movement vectors are present, and considerable habitat alteration is expected. Additional vectors due to project implementation would be minimal, and mitigation measures reduce the risk of spreading weeds.

## Forest Plan Consistency

Alternatives 1 and 2 would maintain viable populations of all native and desired non-native plants, and the proposed activities were reviewed for potential effects on rare species, and thus would be compliant with Forest Service Manual direction. With the evaluation of project effects, risk of weed spread, and implementation of design features for botanical resources, compliance with the White River Forest Plan, Forest Service Manual 2900, and Executive Order 13112 would also be achieved.

# Fire and Fuels

## Resource Description

This resource section analyzes how the proposed project would affect wildland fuel loading and future wildland fire behavior across the project area. Goals of reducing fire hazard include reducing fire line intensities, reducing the potential for crown fires, and improving fire resiliency to values at risk. Overall objectives for fuels include reducing surface fuel loadings, enhancing forest structure, and returning low to moderate severity surface fire to the landscape. Reducing canopy bulk density, raising canopy base height, and reducing surface fuels would improve the resiliency of these stands to potential fire effects. Fuels reduction can be accomplished by modifying the size, arrangement, density, and density of, canopy, ladder, and surface fuels.

The project area contains a variety of fuels including grass, brush, aspen, and mixed conifer. Grass and brush can be categorized into fire regime group I, where naturally occurring fires burn at low severity with short return intervals. Aspen and mixed conifer can be categorized into fire regime IV, where naturally occurring fires burn at high severity with moderate return intervals. A high percentage of the areas identified for treatment can be classified as Vegetation Condition Class II.A and II.B, meaning they have a moderate to high departure from the historical range of variability (HRV).

Overall, the fuel model that best describes the project area is standard fire behavior fuel model TU5, Very High Load, Dry Climate Timber-Shrub (Scott and Burgan).

## Direct and Indirect Effects

### Alternative 1 – No Action

The no action alternative allows the forested and non-forested stands to go through their natural ecological progression, which has been, and will continue to be altered by fire suppression. In approximately 50 years, aspen stands could begin to deteriorate from age and the mountain brush fields would become decadent and overgrown. In mixed conifer stands, existing intermediate trees and advanced regeneration would mature into the overstory. The understory would have a mixture of brush, grass, and forbs. Individual trees and snags would fall, increasing heavy fuel loading. This understory would contain large down logs, small mixed conifer trees, ladder fuels, and a mix of grasses, forbs and brush. A fuel profile such as this, could contribute to negative effects associated with a potential wildfire and community infrastructure (roads, trails, ski areas) within National Forest System lands.

### Alternative 2 – Proposed Action

**1) Vegetation Management**

Vegetation treatments would reduce crown bulk density in forest stands, which is one of the parameters for crown fire initiation and propagation. Reducing crown bulk density by removing live and dead trees has the potential to influence fire behavior within the treated stands. Although fire behavior and effects of wildland fires may be changed within a particular treatment unit or stand, vegetation treatments alone are not expected to influence adjacent and outlying stands in any appreciable manner.

**2) Fire and Fuels**

- **Prescribed Fire:** The objective of reintroducing fire into the area is to regenerate aspen forests and to reduce hazardous fuel accumulations, thus reducing the risk to life, property, and natural resources in the event of a wildfire.

  Applying multiple entries of prescribed fire in the mixed mountain shrub systems has proven effective in reducing fuel loadings, which reduces fire behavior effects (flame length and rate of spread) during a landscape-sized wildfire. Fire managers are given more options to manage, redirect, and/or suppress wildland fires burning under these conditions, even during extreme drought. Prescribed burns that were conducted on the Sopris Ranger District at similar site locations on Basalt Mountain clearly altered the fire behavior of the Lake Christine wildfire. This placed fewer values at imminent risk, created less intense fire behavior, and provided more options for firefighters to engage the fire under safer conditions with higher probabilities of success (Butler 2018). Although behavior and effects of wildland fires can be changed within a particular

treatment unit or stand, the behavior and progress of a much larger fire may not be affected by small treatment units. Fire progression maps often reveal that small units are circumvented by large wildland fires (Salazar and Gonzales-Caban 1987) with little net effect on the overall growth of the fire. Instead, the progress of large wildland fires is affected by treatments that are (1) comparable to the size of the fire, or (2) by treatments that collectively disrupt the growth of fires (Brackebusch 1973, Finney 2001a, Gill and Bradstock 1998). This is evident with the Lake Christine example described earlier and connecting larger treatment areas across landscapes has proven more effective at reducing flame lengths and rate of spread.

- **Communications Site:** Creating defensible space has proven to be an effective tool at preventing infrastructure loss. However, physical hardening of any flammable structure is also necessary to complete the picture. More than 75 percent of structure loss during wildland fires is from wind-driven firebrands. Coordination should be accomplished among the Forest Service realty specialist, cooperating agencies, and entities with interests on Sunlight Peak.

**3) Sunlight Ski Area Forest Health**

Treatments within the ski area boundary would be designed to promote long-term forest health. Implementation of forest health treatments on 0 to 20 acres annually are not likely on a scale large enough to have an effect on hazardous fuel buildup or fire behavior.

**4) Recreation Enhancements**

Recreation enhancements proposed by this project including a new parking area, snowmobile route, and gate relocation would not have an effect on fuel loading or fire behavior.

The Sunlight Glading treatment would have an effect on hazardous fuel build up since tree removal or pile and burning is required. Residual fuel loading would be similar to the existing condition.

**5) Expansion of Borrow Source**

Expanding the footprint of the current borrow source location would not have an effect on fuel loading or fire behavior.

## Cumulative Effects

Vegetation treatments proposed by the County Line project combined with past vegetation management activities within the project area have the potential to influence fire behavior in treated stands by reducing the crown bulk density through the removal of live and dead trees. Past, present and foreseeable vegetation treatments combined with proposed prescribed fire treatment units occurring across the greater landscape may influence fire behavior in treated stands which in turn may change fire outcomes on adjacent stands. Research from the 1988 Yellowstone fires and recently published fire histories from Rocky Mountain National Park indicate that the majority of the natural fires occurring in lodgepole pine types and high-elevation mixed conifer are drought and weather rather than fuel-driven events (Despain 1990, Buechling and Baker 2004, Schoennagel et al. 2004). Hence, one should eventually expect that a large-scale stand-replacement fire event will occur in the County Line analysis area. The proposed action in

combination with past, present and foreseeable actions would not create negative cumulative effects to the County Line project area.

## Forest Plan Consistency

### White River National Forest Land and Resource Management Plan

The treatments described in the proposed action are consistent with the fire and fuels standards and guidelines stated in the White River National Forest Plan.

### White River National Forest Fire Management Plan

Interagency Federal fire policy requires that every area with burnable vegetation must have a fire management plan. The White River National Forest fire management plan provides information with regard to the fire process for the Forest and compiles guidance from existing sources such as, but not limited to, the White River Forest Plan, national policy, and national and regional directives.

The potential consequences to firefighter and public safety and welfare, natural and cultural resources, and values to be protected help determine the management response to wildfire. Firefighter and public safety are the first consideration and are always the priority during every response to wildfire.

The proposed actions are also consistent with national plans and strategies listed here.

- *The Federal Land Assistance, Management and Enhancement Act of 2009*
- *National Cohesive Wildland Fire Management Strategy*
- *National Fire Plan*
- *Healthy Forests Restoration Act of 2003*

# Aquatic Resources

## Resource Description

The analysis area comprises approximately 33,000 acres, includes areas proposed for prescribed fire and timber harvest, and encompasses proposed haul routes. Specifically, the analysis area focused on the streams containing populations of Colorado River cutthroat trout, associated riparian areas, wetlands, and upland areas within the Fourmile and Thompson Creek 6$^{th}$ field sub-watersheds. All of the project area water eventually contributes to the Roaring Fork and Colorado Rivers. Elevations within the 33,000-acre project area range from about 7,800 feet to about 10,900 feet.

Effects to species covered by the Endangered Species Act and Forest Service Region 2 Sensitive aquatic species were discussed in greater detail in the Biological Assessment and Evaluation for Aquatic Species Related to the County Line Project (2018) associated with this EA. In summary, a Conservation Population (less than 10 percent genetic introgression or hybridization with other trout species/subspecies; Utah Division of Wildlife Resources 2000; Metcalf et al. 2012) of green lineage Colorado River cutthroat trout occupies Park Creek, in the Thompson Creek watershed (see figure 11). Green lineage cutthroat are being treated by Forest Service Region 2 as a threatened species under the provisions of the Endangered Species Act. Colorado River cutthroat

trout (*Oncorhynchus clarkii pleuriticus*; all lineages) are Forest Service Region 2 Sensitive species and are found in North and Middle Thompson Creeks, within the project area.

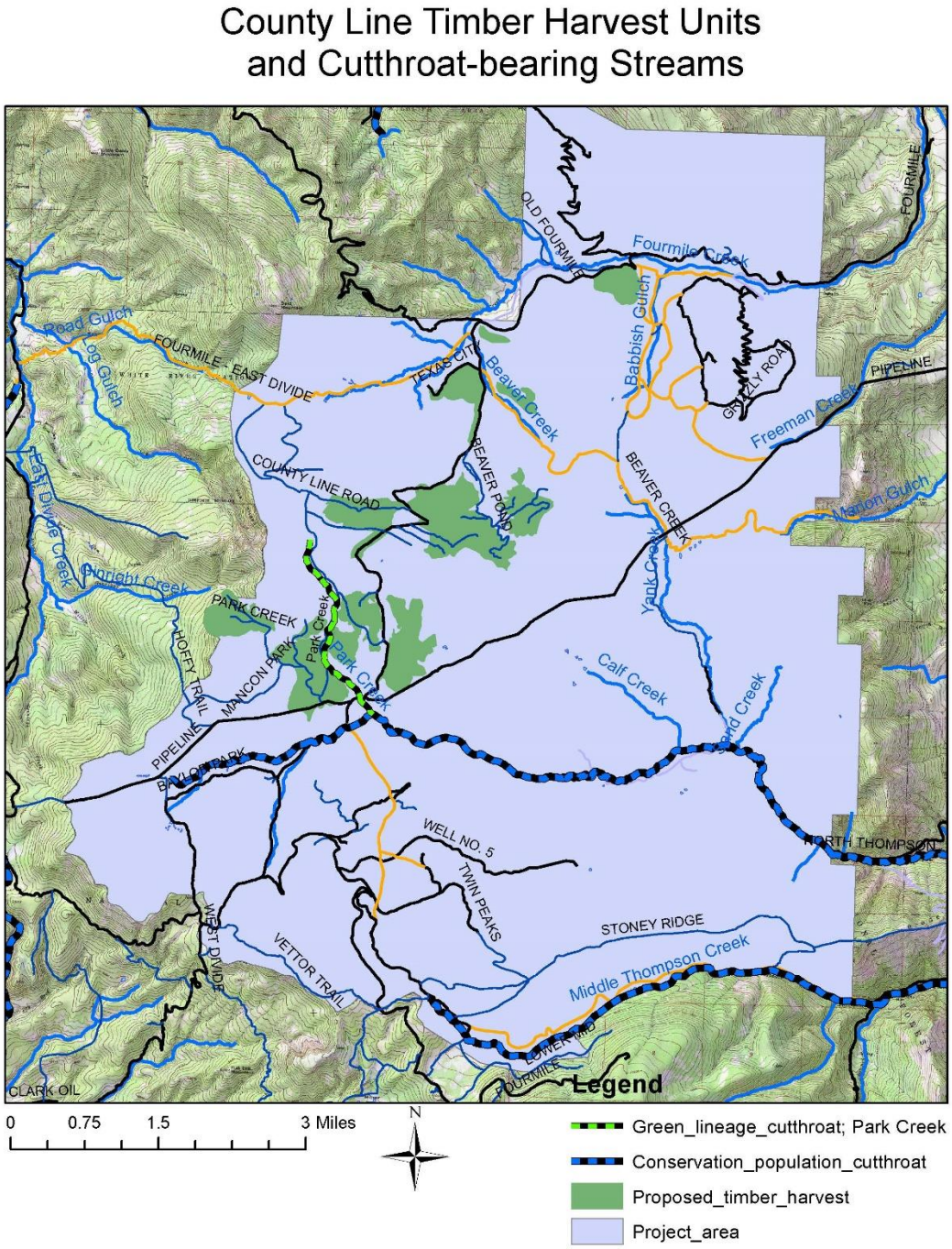


**Figure 11. County Line timber harvest units and cutthroat trout-bearing streams**

Park Creek is a small, narrow stream, less than 2 miles long, with a high percentage of fine substrate (20 percent in 2015) and shallow pool depths. Summer water temperatures in Park Creek, while able to sustain cutthroat generally, are often warm enough to likely induce temperature stress. Park Creek went dry during the summer of 2018, and it is therefore, highly

likely that that population is functionally if not actually extirpated (the population got too small to remain genetically viable, if they didn't all die). An existing culvert near the mouth of Park Creek is believed to be a barrier that prevents trout from swimming up from North Thompson Creek back into the upper reaches of Park Creek. Despite the drought of 2018, and its effect on the Park Creek population, this analysis assumed that Park Creek remains viable, if degraded, cutthroat habitat. Aquatic macroinvertebrate data indicated that the invertebrate community in Park Creek was populated with taxa tolerant of higher levels of fine sediment and nutrients than found in other similar streams, suggesting a degree of ecological impairment.

North and Middle Thompson Creeks contain conservation populations of Colorado River cutthroat trout (the precise lineage has not be determined) along with other, non-native trout species. No data are available to further describe these fish populations. Aquatic macroinvertebrate data suggested that habitat in Middle Thompson Creek, at least at the sample site, was in very good condition.

The range of northern leopard frogs (*Lithobates pipiens*; frogs) includes the analysis area. Northern leopard frogs are a sensitive species in Forest Service Region 2. Amphibian surveys have been conducted at approximately 22 sites within the analysis area, and no northern leopard frogs have been observed. However, because of the availability of their associated wetland habitat types, the presence of northern leopard frogs is plausible, and therefore, assumed.

## Direct and Indirect Effects

### Alternative 1 – No Action

The no-action alternative would have no effect on green lineage cutthroat and no impact on cutthroat (any lineage) or frogs as it would have no means to affect change in instream habitat conditions.

### Alternative 2 – Proposed Action

Components of the proposed action that could affect aquatic species include timber felling, temporary road development, timber hauling, and prescribed fire. Harvesting trees that provide shade and large wood to streams can increase sun exposure, and therefore, stream temperatures. Reductions in the wood supply can degrade stream habitat by reducing the frequency and depth of pools and produce adverse changes in sediment size distribution. Northern leopard frogs disperse through upland habitats, and are thus vulnerable to mortality by ground-based logging equipment. Temporary roads and their use can produce sediment through the erosion of exposed soils and route that sediment and excess water to streams. Heavy truck traffic related to timber haul on natural surface and gravel roads can also produce sediment and deliver sediment to streams. High-intensity fire and fire-related activities in riparian areas can remove streamside vegetation, increasing sun exposure and sediment input to streams.

These types of direct effects on aquatic habitat, in turn, affect aquatic animals and their populations. Trout require cold water with a high oxygen content and elevated water temperatures can at least alter their behavior, and at most, produce mortality. Increasing levels of fine sediment in streams fill in interstitial spaces in the streambed, decreasing aquatic macroinvertebrate productivity, which reduces the primary food source for cutthroat. Siltation can snuff out trout eggs in pool tails and bury recently hatched fry. Excessive fine sediments, particularly in the

absence of sufficient large wood, fill in pools that trout rely on for cover from predators, use as low-energy feeding locations, and provide spawning gravel and overwintering habitat.

No cutthroat-bearing streams or their tributaries are known to be included in the proposed timber harvest units. Streams including tributaries to cutthroat streams subsequently identified would have no-harvest buffers of at least 100 feet, which would preclude impacts to stream habitat from timber harvest.

The timbered portion of proposed timber harvest unit 109 would be adjacent to about 1,600 feet of Park Creek, on its western edge, but set back at least 100 feet from the edge of the stream. Particularly in the context of the "group selection" harvest proposed, which would leave 75 to 80 percent of the stand forested (see Proposed Action for a more thorough description), the no-harvest buffer of 100 feet would be sufficient to preclude effects to instream habitat (in regard to stream temperatures, sediment, and large wood contributions).

If the need for a temporary road or stream crossing(s) is subsequently determined, impacts to cutthroat would be precluded because the crossing would not be where cutthroat reside (in Park Creek), and because design features would minimize impacts to stream habitat to an immeasurable degree.

Impacts to cutthroat would, therefore, be limited to indirect effects to their habitat related to fluvial sediment transport from the haul route via road or stream crossings to cutthroat-bearing stream reaches in North Thompson Creek. Proposed timber haul would cross a lower reach of Park Creek, which contains cutthroat and flows into North Thompson Creek. Timber haul over that crossing would likely incrementally, but immeasurably, contribute to sediment delivered from the road surface to North Thompson Creek, beyond the background rate of sediment produced by other, non-project-related vehicle traffic on that road. The Watershed and Hydrology Effects Analysis Report associated with this EA concurred that the proposed action would maintain existing stream health conditions.

During implementation of the proposed prescribed fire, intense fire activity would be deliberately kept at least 100 feet away from streams, including cutthroat-bearing streams. This buffer would also exclude equipment travel related to prescribed fire, tree felling, fire lines, and slash-piling and burning. Light burning within the buffer would be acceptable if organic matter could be maintained. Because prescribed fires would be deliberately steered out of riparian corridors (within 100 feet of streams) and because wildfire is part of the natural disturbance regime of these watersheds, no adverse (or beneficial) impacts to stream habitat would be expected.

Therefore, the proposed action would have no effect on green lineage cutthroat in Park Creek and no impact to cutthroat in North and Middle Thompson Creeks.

Timber harvest and haul could affect frogs because frogs disperse overland through upland habitat and would, therefore, be exposed to timber harvest-related mortality (by being run over, for example). The proposed prescribed fire could similarly catch individual frogs in upland areas. Given, however, that it is highly speculative that there is a frog population in the analysis area and that frogs have evolved in an environment where periodic wildfire is part of the natural disturbance regime, prescribed fire would be unlikely to impact frogs.

Because frogs would potentially face direct mortality from timber harvest-related activities in upland habitats, the proposed action could adversely impact individuals, but would not be likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.

### Cumulative Effects

Reasonably foreseeable actions that could influence aquatic species or their habitat in the analysis area include additional timber harvest, continued private and commercial recreational use, livestock grazing, and unrelated road maintenance of the existing road network.

Given the immeasurably small increases in sediment that the proposed action would be expected to route into cutthroat-bearing streams, the proposed action would not measurably contribute to a cumulative effect on cutthroat or their habitat. While the proposed action could make an incremental, cumulative contribution to frogs' decline throughout their range, the project would not be likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing because, given the lack of frog observations during local monitoring, there is a low probability that there is a resident population that would be impacted.

### Forest Plan Consistency

The project is consistent with the components of the White River Forest Plan, specifically Goal 1, Objective 1b, and Water and Riparian Standard 1.

## Forest Vegetation

### Resource Description

The project area contains a variety of cover-types including aspen, mixed conifer, grass, and shrublands. Within these stands species composition can be varied with some areas growing in pure stands while others contain a mix of species. Within the aspen cover-type there is a lack of age class diversity with the majority of the stands containing mature trees. There is a minor amount of natural regeneration occurring in some stands, however growth rates are hindered and mortality rates are high due to grazing and foraging pressure from cattle and wildlife. In other areas of the project mature aspen are beginning to show signs of decline possibly due to drought or climate change.

The mixed conifer cover-type (Engelmann spruce – subalpine fir) has been affected by a spruce beetle outbreak that occurred in the late 1990s. Salvage harvests occurred in the southern portion of the treatment area to address the added mortality caused by the spruce beetle outbreak. In other areas of the project including the majority of proposed group selection treatment units, stands have been previously harvested between 1985 and 1995. These stands were treated utilizing a shelterwood preparation harvest which is the first step in an even-aged management regime.

### Direct and Indirect Effects

#### Alternative 1 – No Action

Under the no action alternative natural ecological processes would continue in the project area. No of the proposed projects that aim to treat forested vegetation would occur and the area would continue to be used for recreation, personal use forest product gathering, hunting, fishing, and grazing.

## Alternative 2 – Proposed Action

### 1) Vegetation Management

***Coppice Clearcut:*** Aspen stands proposed for treatment are considered seral, meaning there are conifer trees present in the overstory to varying degrees. Studies suggest that although aspen suckering may be occurring, young aspen would unlikely mature into the overstory unless there is some sort of disturbance that reduces competition and creates a gap in the overstory. The result would be a loss of overall aspen in the stand as the presence of conifer increases over time (Smith and Smith 2005). The removal of all trees within the treatment units would provide favorable conditions for the establishment of a young aspen stands, as aspen is a disturbance-related species, regeneration success can be closely correlated to the amount of disturbance (Perala 1990). This project proposes openings that are larger than 40 acres in size. Large openings in aspen emulate natural patch size and are within the historic range of variation for this species. Coppice cutting would regenerate approximately 538 acres across the landscape.

Cattle grazing does occur within the project area and can be a hindrance to aspen regeneration as cattle may trample regeneration or graze on new aspen shoots. Shepperd (2001) found that if several areas larger than 15 to 20 acres (6 to 8 hectares) were clear-felled at one time, the amount of damage by herbivory was decreased. Regenerating larger areas of aspen, as this project proposes, may help to ease browsing pressure within stands. Additional efforts to limit grazing impacts to regenerating aspen stands may involve leaving activity slash in place or altering grazing schedules in the area to allow young aspen to become established. Temporary fencing can also be used to keep livestock from grazing in recently harvested aspen stands.

***Group Selection:*** Units 101 through 104, 109, and 110 were previously logged approximately 30 years ago using a shelterwood preparation silviculture prescription. This treatment was commonly applied to spruce-fir stands in the mid to late 1980s, and was designed to be the first step in creating an even-aged stand. Over time, the desired condition for these stands has changed. Currently, the desire is to have varying age classes and species types within the stand, making it more resilient should an outbreak of spruce beetle occur. Proposed treatments would provide opportunities to create a new age class within the stand, while maintaining a mature overstory.

Existing advanced regeneration may experience minor losses (incidental damage) due to harvest activities. Groups and single tree selection would be placed in a manner to minimize damage to existing areas of advanced regeneration. Advanced regeneration located adjacent to group openings or individual trees designated for removal may respond positively due to a decrease in competition for nutrients, water, and available sunlight. Retaining mature cone-bearing trees near created openings ensures that a seed source exists to promote natural regeneration.

### 2) Fire and Fuels

***Prescribed Fire:*** Prescribed fire is proposed on approximately 13,661 acres of forest lands. Vegetation types that would be targeted for treatment include mountain shrub, grass/forb, and aspen. Where applied, this prescription seeks to regenerate targeted vegetation types. In areas consisting of grass/forb and mountain shrub prescribed fire would consume decadent vegetation that often suppresses new forage. In the aspen cover-type, prescribed fire can be used to regenerate stands as an alternative to timber harvesting. In areas where sufficient heat is generated to kill overstory trees and stimulate aspen suckering, a new age class of aspen would develop, aiding in increasing young stands within the Fourmile area. In areas that burn less intensely, fewer overstory trees would be killed and less aspen regeneration would be expected.

Different burn intensities across the proposed prescribed fire areas would result in a mosaic of ages and structural conditions within the aspen cover-type.

***Communications Site:*** The proposed treatments at the Sunlight communications site would provide defensible space and reduced fuel loadings around important infrastructure. Thinning trees adjacent to the communications site would be considered an intermediate treatment that would reduce the number of trees adjacent to the site, and would not create conditions favorable to the regeneration of the stand. Treatments of this type would not result in a loss of forest cover over the long term.

**3) Sunlight Ski Area Forest Health**

Treatments within the ski area boundary are designed to promote long-term forest health and to maintain forest cover over the long term. Managing proactively to promote new age classes and structural diversity within the ski area would ensure that desired forest cover would be maintained over the long term. Addressing current needs such as hazard tree removal would provide for public safety and would not result in the loss of forest cover over the short or long term. High value trees in recreation areas are generally large character trees near areas where people congregate. Protecting these trees from insect infestation would help to ensure that these types of trees continue to be present within the ski area boundary.

**4) Recreation Enhancements**

***Parking Area:*** The proposed location of the parking area is within a coppice clearcut unit. As a result, no additional trees would be need to be removed for construction. The parking area would not regenerate, resulting in a minor loss of forest cover.

***Snowmobile Route***: Constructing a new snowmobile route would result in a short-term loss of forest cover along the trail location. Tree removal would be incidental in nature and would likely have grass and forbs growing in the corridor during the summer months.

***Gate Relocation***: Relocating the gate on NFS Road 300 would provide opportunities to disperse impacts associated with Christmas tree cutting in the project area. The forested locations closest to the current gate location have been over-used for Christmas tree cutting. Allowing for additional areas to be available along the roadside would increase the easily accessible areas and ease the current demand on the over-used area.

***Sunlight Glading***: Thinning treatments would reduce the amount of basal area within proposed stands. Thinning would maintain forest cover, and would be considered an intermediate treatment that would not provide favorable conditions for regeneration. Thinning the proposed stands would also provide for structural diversity in the aspen cover-type.

**5) Expansion of Borrow Source**: Expanding the footprint of the current borrow source location would result in an incidental loss of forest cover. This loss could be recovered if, in the future the borrow source was no longer needed and the site was rehabilitated.

## Cumulative Effects

The proposed vegetation treatments and prescribed fire treatments in the aspen and spruce-fir cover-types, combined with previous harvest treatments in the Fourmile area would aid in creating diversity across the landscape. Varying age classes, structural stages, and species creates a landscape that is more resilient following natural disturbances.

Other proposed projects such as ski area glading and defensible space treatments at the communications site would not result in the loss of available growing capacity across the project area. Some projects would result in the loss of forest cover, however this loss is expected to be incidental and would not contribute negative cumulative effects to the analysis area.

### Forest Plan Consistency

The proposed action is consistent with the components of the White River Forest Plan and the National Forest Management Act (NFMA).

## Heritage

This section summarizes the potential effects on cultural resources from the proposed project treatments. Cultural resources include both archaeological sites and historic structures that reflect past human interactions, as well as human use of the landscape and its resources. These cultural properties have value for their association with important events or people in our history, their distinctive historical style, or their potential to provide important information about our past. Cultural resources that are determined to be eligible to the National Register of Historic Places (national register) are considered historic properties that are managed to avoid or mitigate impacts to their integrity. Cultural resources determined to be ineligible for the national register have no management requirements. Any cultural sites that have not been evaluated for potential national register eligibility must be treated as eligible sites and given the same level of protection.

### Resource Description

A GIS analysis of cultural site data within the proposed area for this project found that there are only 21 known national register eligible cultural sites within the area of potential effect. All 21 sites consist of prehistoric lithic scatter sites; some also contain groundstone artifacts. There are no other known eligible or unevaluated prehistoric or historic cultural sites within the project area. Since portions of the project area have not yet undergone cultural resource surveys, there is also the potential for other prehistoric and/or historic sites to be present.

### Direct and Indirect Effects

#### Alternative 1 – No Action

Under the No Action alternative, historic properties would be unaffected. If the project was not implemented, there would be no potential for disturbance to cultural resources. Therefore, any archaeological properties that exist within the project area would likely remain undisturbed.

#### Alternative 2 – Proposed Action

**Direct Effects.** Potential adverse impacts may occur to both previously recorded and currently unknown cultural sites. These potential impacts could include soil disturbance within cultural sites as a result of temporary road/landing construction, disturbance from heavy mechanical equipment, or disturbance from construction of fire lines. Although there are no known historic structures within the project area, potential impacts of prescribed fire also could include burning of any as yet unknown historic structures. However, the heritage design features for this project require thorough cultural surveys be completed, with findings and avoidance or protection measures submitted to the State Historical Preservation Office (SHPO) for comment prior to project implementation. Furthermore, the design features also stipulate that all national register eligible cultural sites would be flagged with a 50-foot buffer and avoided during project

implementation. As a result, no adverse effects on any national register eligible or unevaluated cultural resources should result from this project.

**Indirect Effects.** Indirectly, increased ground visibility as a result of prescribed fire or newly constructed temporary roads could result in increased looting activity at cultural sites within treated areas. Prescribed fire activities and newly constructed temporary roads could also lead to erosion. However, as mentioned above, because the design features require all national register eligible or unevaluated sites to be flagged and avoided by project activities, these potential indirect effects are highly unlikely.

## Cumulative Effects

While this project may have some overlap with grazing or other activities in the area, the design features require all eligible or unevaluated sites to be flagged with a 50-foot buffer and avoided by all project activities. Therefore, there should be no cumulative effects to cultural resources as a result of this proposed project.

## Forest Plan Consistency

The proposed action is consistent with the components of the White River Forest Plan.

# Hydrology

## Resource Description

Water resources in the project area include tributary streams and wetlands primarily within two different 6th level watersheds as defined by the hydrologic unit code (HUC): Thompson Creek and Fourmile Creek (table ). Within these watersheds, irrigation ditches and reservoirs divert water from streams primarily for consumptive uses, and several springs and ponds have been developed for livestock watering. None of the project area watersheds is considered a Public Water Supply watershed (USDA Forest Service 2002). The Forest Plan requires that management activities maintain and protect identified beneficial uses (FSH 2509.25, Ch. 20).

**Table 5. Primary watersheds included in the project analysis area**

| 4th field HUC* | 5th field HUC | 6th field HUC |
|---|---|---|
| Colorado River | Outlet Roaring Fork River | Fourmile Creek |
| | Crystal River | Thompson Creek |

* HUC = hydrologic unit code

### Water Quality

There are no known water quality problems that exist in the project area. However, no recent monitoring has been conducted for nutrients, fecal bacteria, or temperature. No streams in the project area are listed on the Colorado 303(d) list of water quality limited waters (Colorado Department of Public Health and Environment 2016). All watersheds in the project area have some existing non-point sediment sources due to disturbance by past management. Existing management-related sediment sources include ground disturbance along roads and trails, cattle grazing, dispersed campsites, and off-road vehicle tracks.

## Stream Health

Stream health is defined as the condition of a stream compared to the condition of a minimally disturbed reference stream. Reference streams represent natural conditions that are the most attainable for a given channel type, climate, and geology. Stream health in the project streams is evaluated using stream health classes, which are based on habitat conditions as a percent of the reference. Stream health classes include Robust (74 percent or more of reference condition), At-Risk (59 to 74 percent of reference condition), and Diminished (less than 59 percent of reference condition). Habitat condition is quantified by measuring the channel features needed to support aquatic life such as streambed sediment, pool depths, streambank stability and wood frequency (where applicable).

The County Line project primarily proposes activities within the watersheds of the following streams: Park Creek, Fourmile Creek, North Thompson Creek, Middle Thompson Creek, Yank Creek and Beaver Creek. Small amounts of project activities would occur in Ginright Creek, Babbish Gulch, Calf Creek, and Corral Creek, so they will not be considered in detail.

Formal determination of stream health is limited in the Water Conservation Practices Handbook (WCPH) (FSH 2509.25) to a minimum watershed size (3rd order streams). Consequently, some of the streams discussed below have data and a stream health classification presented. Other smaller streams have a qualitative discussion of their condition and may include a listing of problem areas requiring attention, if applicable. Refer to the project file for more description on stream health class determinations.

**Park Creek** is a tributary to North Thompson below Baylor Park and splits into an east and west branch just above the NFS 300 road crossing. Park Creek is a basin where cattle tend to congregate. There are three meadow sections that either show signs of heavy use or are slow in recovering following historic beaver activity. Lower Park Creek, just above the road crossing, is a large meadow area with several historic beaver dams, one of which is large enough that it may have been an in-channel stock pond. The channel is actively adjusting through this reach and vertical, unstable banks are common on the outside of channel bends. The meadow reach in upper Park Creek is deeply incised with eroding banks, again related to adjustments through historic beaver dams. East Park Creek is heavily used by cattle. Aerial photo analysis shows little change in vegetation or beaver activity since the early 1950s. The coarse basalt stream bed has limited incision, but the channel is adjusting laterally in places.

Park Creek stream health was evaluated downstream of proposed cutting units 106 and 211, and between units 107 and 109, where impacts from the proposed vegetation management would most likely occur. The surveyed section of Park Creek is a narrow, gently sloping valley. The surveyed reach has a very stable profile, with roughly 26 percent of the streambed composed of exposed bedrock. Livestock activity is the predominant disturbance mechanism within the stream corridor, and even though streambank stability metrics fall within the Robust health class, localized stream health issues were present at livestock stream crossings and instances of hoof-sheared stream banks. The relatively high percentage of fine material on the streambed (29 percent) and shallow residual pool depths are stream health metrics that fall within the At-Risk stream health class. See table 6.

**Table 6. Existing stream health in Park Creek**

| Stream | UTM | Map Gradient (%) | % Fines | Residual Pool Depth | Unstable Banks (%) |
|---|---|---|---|---|---|
| Park Creek | 13S 291729 4357897 | 3.7 | 29.1 | 0.17 | **15.4** |

Note: Underlined values are in the At-Risk class, no values are in the Diminished class, and bold values are in the Robust class.

Stream and riparian conditions in Park Creek currently exhibit limited recovery potential due to grazing intensity or timing. Although Park Creek is experiencing localized stream health issues, they do not appear significant enough to translate to degraded stream health downstream in North Thompson Creek.

**Fourmile Creek**, above the confluence with Beaver Creek, also has Robust stream health for fine sediment and residual pool depth. Streambank instability levels are very high and in the diminished category (22.7 percent) because the channel has migrated against the valley wall and is actively undercutting the toe of the slope, creating a new floodplain (USDA Forest Service 2011). It is unclear why the channel migrated to its current position, but there has been little observable change since the 1951 aerial photos. The streambed is armored either by bedrock or large pieces of basalt, although large volumes of sand from the eroding banks move through the system each year. Cattle use is observable in the riparian area, but the willow and sedge riparian vegetation is healthy and does not exhibit lasting effects from the seasonal use.

Measured data for **North Thompson Creek** in Baylor Park show Robust stream health for fine sediment and residual pool depths. The amount of streambank instability is low (6.9 percent), but that still ranks as Diminished compared to the reference value of less than 2 percent (USDA Forest Service 2011). Most of the measured bank instability occurs at outside bends of the channel, where it is adjusting its alignment. There were no observed impacts from cattle grazing and the willow and sedge riparian area is thriving. Beavers are actively working in this reach.

**Middle Thompson Creek** has Robust stream health for fine sediment and residual pool depth in two measured reaches. The meadow reach has 7 percent unstable banks, which classifies as Diminished health class; the upper forested reach had a Robust classification for bank stability (USDA Forest Service 2011). The riparian area often has dense willows or a dense sedge mat, so very little of the measured bank instability was caused by cattle trampling. Because of the resident cutthroat trout population, a small area with isolated channel avulsions was fenced in 2010 to limit cattle and elk access until the banks have recovered. In general, the channel substrate consists of gravel and cobble-sized basalt particles, which protects against significant impacts even at livestock or game crossing points.

**Yank Creek**, a tributary to North Thompson Creek, consists of a series of large beaver dams in the upper reaches. The adjacent area is heavily used by cattle for watering and loafing. Most of the impacts from livestock are on the margins of the beaver ponds and consist mainly of trampling of vegetation while gaining access to water. Any sedimentation that might be resulting from soil disturbance is trapped in the beaver ponds. The middle reach of the stream is steeper and more confined. The lower reach, above the Forest boundary, has incised through a sediment deposit behind a very large, failed beaver dam (shown as a pond on the 1986 revision of the U.S. Geological Survey (USGS) topographic maps). The stream cross sectional shape is narrow and rectangular, and is fringed by a narrow row of sedges that give way to upland grasses and weeds

within a couple of feet from the channel edge. Streambanks are stable throughout this reach. In general, Yank Creek is stable and riparian vegetation is thriving.

**Beaver Creek**, a tributary of Fourmile Creek, has cattle use observable in the riparian area, but the willow and sedge riparian vegetation is healthy and doesn't exhibit lasting effects from the seasonal use except at water access points. Generally, Beaver Creek has stable banks in large part due to the healthy willow and sedge vegetation growing along the stream banks. Beaver activity is considerable, so eroded sediments are typically captured and stored before entering Fourmile Creek. Much of the stream is in a meadow system, so wood does not play a primary role in stream channel processes.

### Wetlands

There are approximately 2.6 acres of wetlands within the project area according to the U.S. Fish and Wildlife Service's National Wetland Inventory data, but more are likely present that were not identified in this mapping effort. Wetlands are primarily adjacent to streams within the water influence zone and have been augmented by beavers. The entire County Line project area was not surveyed for wetlands; however, field surveys would occur and wetlands would be identified prior to and avoided during any ground-disturbing activities.

## Direct and Indirect Effects

### Alternative 1 – No action

Under this alternative, none of the proposed fuel treatments would occur and there would be no ground disturbance from mechanical treatments or temporary road construction. Similarly, there would be no ground disturbance from prescribed burning, parking area construction, or borrow area expansion, therefore, stream health metrics would be maintained at their current level. Wetlands, riparian areas and floodplains would be expected to maintain their current condition in the absence of any of the proposed disturbances.

Since there are no direct or indirect effects, there would be no cumulative effect.

### Alternative 2 – Proposed Action

In order to evaluate the effects of the proposed actions on water resources, activities are grouped into three activity categories.

The first category is vegetation management, which includes: conventional logging on approximately 1,597 acres; small-scale ski area vegetation management within 2,390 acres; fuels reduction adjacent to existing infrastructure at Sunlight Ski Area and the Sunlight Peak communications site; and glading of approximately 47 acres at Sunlight Ski Area and along the proposed snowmobile reroute.

The second category of activity is prescribed fire for fuels management and wildlife habitat improvement on 13,661 acres.

The third category is ground-disturbing earthwork that includes 14.8 miles of temporary road construction for vegetation management, construction of a parking area along NFS Road 300, and expanding the existing rock borrow source for road surfacing. Other small actions include moving and replacing existing gates that have no effect to water resources and are not discussed further.

Potential effects to stream health metrics of fine sediment loading and water quality, percentage of unstable banks, residual pool depths, and wood frequency are discussed below.

### *Stream Health: Sedimentation, Pool Depth and Water Quality*

Disturbance in the water influence zones (timber harvest, road or skid trail construction, or high-severity burn) and connected disturbed area (bare ground from roads, landings and skid trails that have a connected path to a water way) are used as indicators to evaluate the effects of proposed activities relative to detrimental sedimentation and/or nutrient loading in streams and water bodies that affect stream health metrics of residual pool depth, fine sediment deposition, and water quality. The proposed project is designed to minimize impacts to streams by providing water influence zone buffers and minimizing ground disturbance near streams or wetlands.

The category of proposed activities that include large-scale vegetation management are mitigated by including a water influence zone buffer, which extends a minimum of 100 feet on either side of all defined stream channels. This buffer width is designed to filter mobile sediment from adjacent ground and maintain shade, infiltration capacity, microhabitats, etc. associated with riparian corridors. No timber felling or skidding is proposed in the water influence zone. As such, no significant increase in stream sedimentation is expected from these vegetation treatments.

The second category of proposed actions is prescribed burning. The primary risks to water quality from these proposed actions are sediment and nutrient delivery to streams from high-intensity fire or from ground disturbance by mechanical equipment. Water temperatures should not be affected because the prescribed low-intensity fire and fire line creation would not remove the canopy over the stream.

The effect of fire on soils and water quality is related to the severity of the fire, and the proportion of the watershed burned (Gresswell 1999). Large fires that burn intensely on steep slopes adjacent to streams, and that remove the organic layer down to bare soil, are most likely to impact water quality. High-intensity burns can impact water quality by increasing sediment, nitrogen, phosphorus, or heavy metal concentrations (Ranalli 2004). As the amount of fuel consumption increases, more nutrients are released and more soil organic matter is consumed, making the site more susceptible to erosion. These impacts may last for weeks or decades, depending on the severity of the burn and the rate of vegetative recovery. In contrast, low-severity prescribed fires have reduced effects on erosion and runoff because the amount of soil heating can be managed and large amounts of organic matter are not consumed (Clark 2001, Ranalli 2004, Neary et al. 2005).

The proposed prescribed burning would avoid significant impacts to water quality by leaving unburned (or lightly burned) strips in the water influence zone along streams. Where riparian areas cannot be avoided, burning would be conducted when the moisture is high enough to prevent complete consumption of the surface organic layer. By maintaining the organic layer inside the water influence zone, any mobilized sediment and nutrients from the burned hillslopes should be filtered before runoff enters the stream. Water influence zone buffers would be field-identified each season before implementation of any prescribed fire.

There is a low risk of prescribed fire triggering landslides into stream channels. Unstable areas are mapped and would be field-verified before implementation.

In summary, small increases in sedimentation and nutrient levels may occur during the first storms following prescribed fire, depending on the proximity of burned areas to water resources.

The most effective way to ensure that these changes in erosion remain a relatively minor input to local streams is to minimize the percentage of a watershed that is disturbed in a given year. Since the proposed areas for prescribed fire are large, they can represent a significant portion of the watersheds described previously (see Table 5). To reduce the possibility of sediment or nutrient effects to stream health, design features that limit the amount of a watershed that can be burned in a single year to 25 percent are proposed. In addition, for the smaller watersheds of Park Creek, Yank Creek, and Beaver Creek, allowing at least one growing season in between successive burns is recommended to allow annual vegetative and hydrologic recovery.

The third category of actions that could affect water quality and stream sedimentation includes temporary road construction, and similar ground-disturbing activities. As discussed in the proposed action, 14.8 miles of temporary road would be needed to accomplish the vegetation treatment. Of those, 10.6 miles already have existing road templates and have been closed to motorized traffic; the remaining 4.2 miles would be new construction. No new stream crossings are proposed and no new connected disturbed areas would result from the project because all new roads would be located outside the water influence zone. Roads would receive varying levels of decommissioning when the project is completed. Similarly, the proposed parking area along NFS Road 300 and the expansion of the borrow source are located well away from wetlands or streams. Thus, because of the vegetated buffers between these activities and project area water resources, this category of proposed actions is expected to maintain the current state of stream sedimentation, pool depth and water quality in the project area watersheds.

The proposed project does include the possibility of applying insecticide to individual trees impacted by bark beetles. Treatments would be localized and targeted at individual trees and sprayed according to the chemical manufacturer's recommendations. No spraying would occur within the water influence zone, so no impacts to water quality are anticipated.

### *Stream Health: Channel Stability*

Streambank stability could primarily be affected by changes in peak discharge from large-scale timber harvest or by direct disturbance from roads or skid trails. As discussed previously, there are no proposed road or skid trail crossings of streams.

Vegetation removal is proposed over a broad area within the project boundary. Literature review of relevant research suggests that water yield and peak flow increases have been demonstrated in small watersheds where as little as 25 percent of the forest cover has been completely removed in a single entry (Jones and Grant 1996). However, increases are generally undetectable or insignificant when harvest levels are below 25 percent (Jones and Grant 1996, Beschta et al. 2000). The proposed action would not increase cumulative harvest levels above 25 percent in any of the project area watersheds (table ) and, therefore, is not expected to increase water yield in any of these watersheds.

For prescribed fire, the combined effects of vegetative cover loss, decreases in soil surface organic matter, and the possible formation of water-repellent soil crusts are some of the primary causal factors for increases in streamflows following fires (Neary et al. 2005). By changing the timing or magnitude of run-off, peak streamflows can increase and detrimentally affect streambank and channel stability. However, significant changes in water quantity are not expected since low-severity prescribed fires typically have little or no effect on peak streamflows because soil organic layers are not intentionally burned (Neary et al. 2003, Neary et al. 2005). For example, on the White River National Forest, monitoring of past burns shows that when oak

brush is burned during wet springtime conditions, only about 15 percent of the organic ground cover is removed.

**Table 7. Percentage of watershed proposed to receive prescriptions for vegetation management**

| Watershed Name | Watershed Size (acres) | Net Acres Harvested | Percent Harvested | Burn Units (acres) | Burn Unit Percentage |
|---|---|---|---|---|---|
| North Thompson[1] | 16,350 | 368 | 2.3% | 8602 | 52.6% |
| Park Creek | 1,720 | 274 | 15.9% | 1613 | 93.6% |
| Yank Creek | 2,530 | 0 | 0% | 1,642 | 65.0% |
| Middle Thompson[2] | 5,150 | 0 | 0% | 1,531 | 29.8% |
| Fourmile Creek[3] | 10,150 | 1,005 | 9.9% | 2,952 | 29.1% |
| Beaver Creek | 1,670 | 117 | 7.0% | 1,099 | 65.8% |

[1] Measured just downstream Yank Creek Confluence;
[2] Measured just upstream of South Branch Confluence;
[3] Measured downstream of Sunlight Ski Area.

Since new temporary roads would be constructed outside the water influence zone and there are no proposed stream crossings by roads or skid trails, the proposed action would not substantively increase the percentage of stream channel network from road ditches acting as tributaries. Consequently, the proposed road system and other ground-disturbing activities in the proposed action would not have a measureable increase in water yield or peak flows.

Since there are no substantive increases in water yield from vegetation treatments or prescribed fire, and no significant increases in water routing from road ditches, the extent of stable banks in each stream reach is expected to be maintained in the long term.

### *Stream Health: Wood Frequency*

Conventional timber harvest, road construction, or high-intensity burning within the water influence zone can result in reductions in large wood frequency and associated pool habitat if trees are removed that would otherwise eventually fall into the stream. There would be no harvest, road construction, or high-intensity burning within the water influence zone, therefore wood frequency would be unaffected by the proposed action.

### *Wetlands and Floodplain*

Wetlands are present in the project area, but timber harvesting, temporary road construction, and prescribed burning activities would avoid wetlands and would not impact wetland or ecological function. Wetland and floodplain ecological and physical function are expected to be maintained in the County Line Project.

## Cumulative Effects

The following analysis describes past, present, and reasonably foreseeable actions within the defined cumulative effects analysis area, and how direct and indirect effects from the proposed projects may be additive in time and space. For direct and indirect effects from the proposed action to be cumulative, they must overlap in both time and space with direct and indirect effects of other past, present and reasonably foreseeable actions in the area.

The spatial extent of the analysis includes two scales. The first is at the scale of local project area streams such as Park Creek, Beaver Creek, Fourmile Creek, Middle and North Thompson Creeks and Yank Creek. The second is at the sub-watershed scale (6th level HUC) for Thompson Creek and Fourmile Creek.

The temporal scale for the cumulative effects analysis is set at 5 to 10 years after implementation. At this time, adaptive measures would have been implemented and evaluated for effectiveness.

Past actions in the project watersheds that influence aquatic conditions include timber harvest, ski area operations, irrigation diversions, livestock grazing and associated stock water developments, road and natural gas pad construction and maintenance, outfitter-guides for hunting, and recreational uses.

Ongoing activities in the project watersheds that influence aquatic conditions basically echo those listed previously for past actions.

Reasonably foreseeable actions in the analysis area that could influence aquatic conditions include ski area operations and development, continued recreational and outfitter-guide use, road use and maintenance, and livestock grazing.

As described previously, this project would not cause significant ground disturbance within the water influence zone, would not increase channel network extension from road ditches, and cumulative harvest levels within all project area watersheds would remain well below the 25 percent threshold, below which increases in water yield are generally undetectable or insignificant (Jones and Grant 1996, Beschta et al. 2000). The result is negligible direct and indirect effects to water resources.

While the potential for cumulative impacts is present, several design features limit their extent and likelihood. These design features include limiting burn intensity, avoiding unstable geology, maintaining water influence zone buffers, and limiting the amount of watershed disturbance in any single year. Even though the proposed actions in these watersheds may cumulatively add sediment or nutrients to the local streams, the relative contribution would be small. Since none of the streams are currently listed as impaired for either sediment or nutrients, no physical or biological threshold is expected to be exceeded and beneficial uses should continue to be supported. Therefore, the project is not expected to contribute to adverse cumulative effects at the local scale. Consequently, there would be no detectable cumulative effect at the 6th level HUC scale for Thompson Creek and Fourmile Creek.

## Forest Plan Consistency

Forest Plan compliance for water resources is essentially determined by compliance with the management measures in the Water Conservation Practices Handbook (FSH 2509.25), which requires that projects “maintain or improve” stream health. With no evidence of a decreasing trend in stream health, this proposed action is complying with the management measures in the Water Conservation Practices Handbook, and is thus, consistent with the Forest Plan direction.

Water quality in project streams is sufficient to support the designated beneficial uses. Floodplains and wetlands are present in the project area, but proposed activities do not significantly impact the processes controlling their ecological function.

# Range

## Resource Description

The proposed action occurs entirely within the North Thompson/Fourmile C&H grazing allotment. Currently, four permit holders are allowed to graze on this allotment. The permits allow for a total of 862 cattle to graze the area from June 26 through October 10, although an additional 66 pairs will likely be granted before the next grazing season. This allotment is managed with a rest-rotation grazing system. This means that some pastures are not used each calendar year. Cutting units are in the following pastures: Marion/Babbish, Fourmile, Calf Creek, and Baylor Park. Prescribed fire units are in every pasture except Spring Gulch (see figure 12). There are 4 permit holders that run cattle on this allotment and 1 hired range rider who oversees the day-to-day operations.

## Direct and Indirect Effects

### Alternative 1 – No Action

Under this alternative, none of the proposed fuel or vegetation treatments would occur and there would be no ground disturbance from temporary road construction, parking area construction or borrow source expansion. Therefore, there would be no forage lost or impact to grazing rotations. Without any of the proposed disturbances, current conditions and objectives across the allotment should be maintained.

### Alternative 2 – Proposed Action

- Opening of canopy from timber harvest would temporarily increase forage production in clearings. Cattle may graze on new grass and or forb growth and browse trees and shrubs as they come in. Keeping cattle out of revegetation areas can be challenging and costly depending on methods used. Prolonged periods of exclusion can also impact adjacent vegetation.
- Clearing of thick timber and deadfall from harvest or prescribed fire would change how cattle move across the landscape. Removal of natural barriers or fences would impact permittees' ability to adhere to rotation schedules. Timber units 108, 207, 208, and 209 have the Corral Creek fence (range improvement number 310006) running north-south through the middle of each unit. The permittees have spent several years maintaining and upgrading this pasture boundary fence from an old worm fence to a new wildlife-friendly lay down fence. Half to three-quarters of the fence has been completed. Unit 110 is bisected by the boundary fence between East Divide Creek (managed by the Rifle Ranger District) and the North Thompson-Fourmile Allotments (range improvement number 806081).
- Timber and fire activities could temporarily displace cattle through direct and indirect effects making adherence to the prescribed rotations more challenging and putting added stress on other pastures.
- Timber harvest activities could temporarily damage range improvements, including fences, broken from down trees or fire and cattle guard wings run into by trucks.

## Cumulative Effects

Current and ongoing oil/gas well and pipeline maintenance activities already displace cattle from prescribed grazing rotations. It is possible that timber operations and prescribed fire actions may

exacerbate these issues in the short term. Fuels treatments and winter timber activities generally occur outside the grazing season and should have minimal effect on range resources. Additionally, implementation of the proposed action would have minimal long-term impacts to desired range conditions.

## Forest Plan Consistency

If livestock are displaced or disrupted from grazing in certain areas, it may cause them to congregate in smaller portions of the pasture, which could affect utilization and required Forest Plan standards. With adherence to design features and ongoing coordination between the range and timber departments when yearly grazing plans are developed, Forest Plan consistency should be maintained.

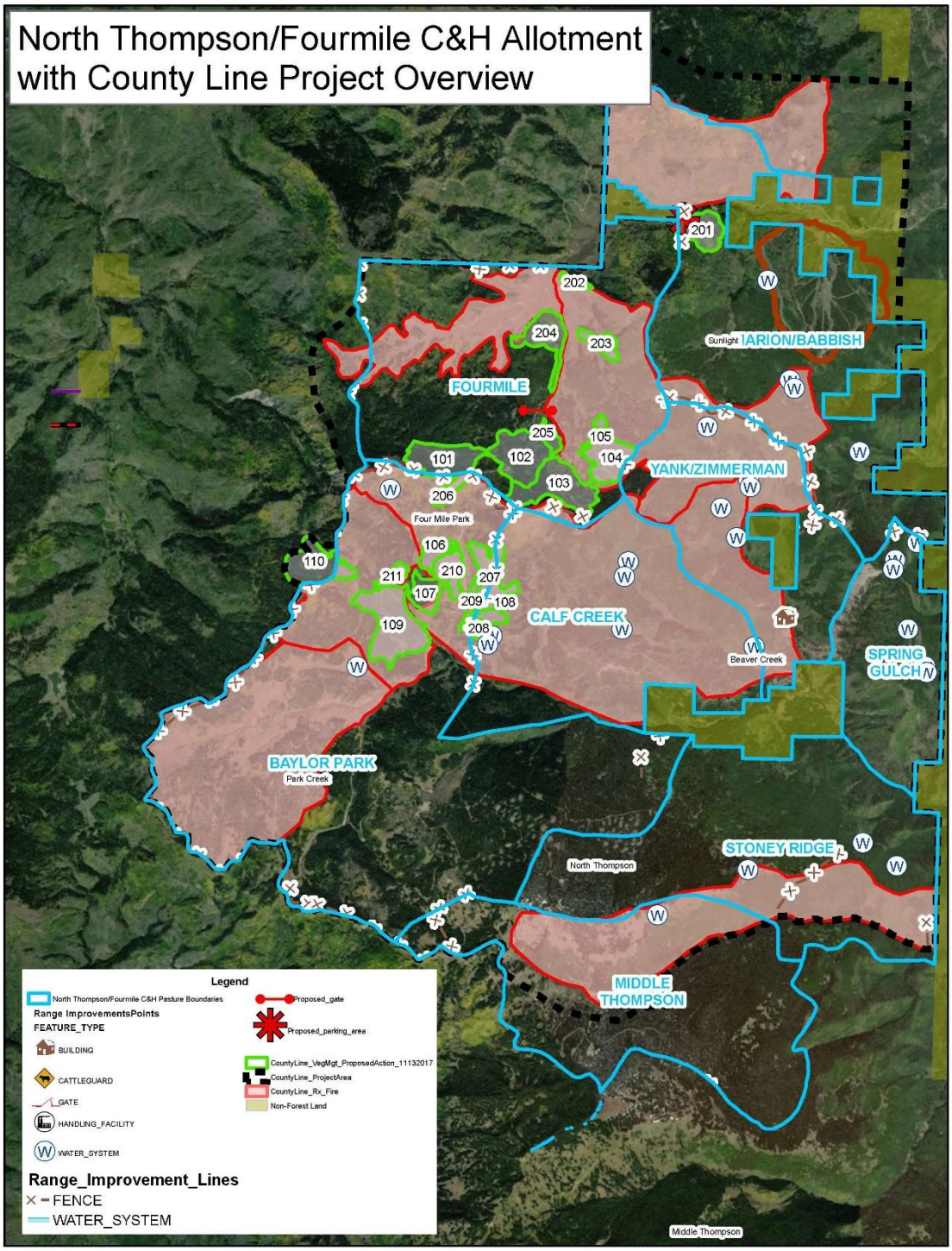


**Figure 12. North Thompson-Fourmile C&H Allotment with County Line Project overview**

# Recreation (including Ski Areas)

The recreation section analyzes the effect to recreation opportunities in the project area with a qualitative discussion of short- and long-term changes that could occur due to proposed

treatments. These changes are defined as displacement of users, restrictions to access, loss of opportunities to pursue recreational activities, or changes to the recreation opportunity spectrum (ROS) class. Short-term changes would occur during the life of the project, approximately 3 to 5 years. Long-term changes would be chronic and occur into the future, more than 5 years in duration.

## Resource Description

Recreation use in the project area is mainly dispersed in nature, with few facilities. Camping, ATV riding, bicycling, hiking, hunting, and winter recreation activities (snowmobiling, skiing) are the main recreational pursuits. One snowmobile outfitter uses the project area for tours, with an average of 730 clients per year (3,767 total guests over the last 5 years). The main recreational access is through Fourmile Road/County Road 117, which takes visitors to NFS Road 300. A trailhead is located on this road, which allows non-motorized users to access the Beaver Creek Trail. A second, large trailhead is used for winter recreation parking. Backcountry skiers use Road 300 to access Williams Peak. Sunlight Peak is a common destination via a 3.75-mile road (NFS Road 318); this road is used for mountain biking, hiking, and ATV riding. In winter, a portion of Road 300 is maintained for motorized access; a gate is closed in December, prohibiting motorized access approximately 3 miles past the ski area near Fourmile Park. Three non-motorized trails are located partially within the project area: Middle Thompson #1950, Fourmile-East Divide #2091, and Beaver Creek #2092.

The 700-acre Sunlight Mountain Resort Ski Area is located in the project area. It is typically open for skiing from mid-December until the beginning of April. Terrain is largely beginner or intermediate with interspersed expert slopes. Summer activities within the resort boundary include public access mountain biking and hiking, as well as horseback tours, and weddings offered under Sunlight Mountain Resort's special use permit.

Within the project area, the ROS classes range from rural to semiprimitive non-motorized (SPNM) in summer. In winter, the ROS class of SPNM is not present. In the areas proposed for vegetation treatments, the summer SPM (semiprimitive motorized) acres total 851 and the SPNM 137 acres. Roaded natural and roaded modified make up the bulk of the ROS classes within the vegetation treatment units. In the areas proposed for burning, the highest number of acres is in the SPNM Class (6,016) with 3,003 acres in SPM.

## Direct and Indirect Effects

### Alternative 1 – No Action

Taking no action would not immediately nor in the long term change existing recreation opportunities in the area. Any direct and indirect effects of the no-action alternative on the recreation resource would be caused by continued fuel loading and decreased forest health. A stand-replacing fire would affect the recreation experience for a considerable length of time and could include closures, restrictions, downfall, and loss of dispersed campsites.

In the long term, conflicts and public safety issues would continue over non-motorized and motorized uses and parking. The same opportunities as present would continue at the Sunlight Ski Area unless forest health concerns caused closures or restrictions.

## Alternative 2 – Proposed Action

Direct and indirect effects to recreation are highly dependent on individual visitor preference and resulting behavior. Several studies have identified a greater level of sophistication among fire-affected communities in both their understanding and acceptance of fire management techniques when compared to the general population. Additional work in fire-prone areas indicates a number of similar factors influence public support for fuel treatments, despite geographic and economic differences. Though treatments could be ongoing, visitors who are aware of the drivers behind these treatments may be more willing to recreate in these areas rather than be displaced by them (Shindler and Toman 2003).

The project is distributed across a large area and proposed treatments are not contiguous. It is unlikely that a visitor who has been temporarily displaced would be unable to find another suitable dispersed recreation opportunity within a short distance.

### *Burning*

Short-term changes in recreation opportunity:

- Burning would take place outside of the summer and winter use seasons. The main groups of recreation users that would be affected are hunters and users of the three non-motorized trails that are within burn units. It is likely that during burn operations, the portions of trail within the treatment area would be closed to access.
- Other effects to recreation from burning would include noise, increased traffic, potential low-level helicopter flights, smoke, and dust. Research on the impact of noise pollution on landscapes suggests sounds from the project area could impact people recreating a short distance from the actual project activities. Soundscape research in Rocky Mountain National Park suggests visitors travel an average of at least a half mile from common noise factors to reach natural quiet (Park et al. 2010).
- Smoke in the air during burning may have a direct effect to the quality of the recreation experience within the project area and in the adjacent dispersed camping areas by temporarily reducing air quality and visibility. Some national forest roads may be affected by smoke and this could affect driving opportunities. The smoke could spread over a large area, and depending on the fuel, humidity, and prescription, it could linger for several days. Large logs and snags could smolder and burn for indefinite periods.
- Smoke from pile burning would result in short-term effects in portions of the project area. Effects could include user dissatisfaction and displacement, and temporarily reduced views from the smoke obscuring the surrounding visual landscape. Pile burning is often completed on the day of ignition, but the effects could last longer if large fuels are present in piles.
- The presence of active fire, while controlled, could cause some visitors anxiety, and they could change their travel plans. Smoke may settle into the lower draws and drainages during the evening hours following ignition. Visitors may choose to avoid favorite areas during this time.
- The effects from burning would cause temporary, but not permanent, changes in some areas classified as SPNM and SPM ROS. The objective of low to moderate interaction between visitors and predominately natural-appearing environments would not always be met

because some operations would involve encounters with crews and equipment and short-term visual changes.

Long-term changes to recreation opportunity:

- Some favorite camping areas would likely be abandoned for several years due to the presence of snags or for appearance (blackened trees and stumps). Some visitors may choose not to use the portions of non-motorized trails that were in the burn units because of the appearance. New dispersed campsites could be created in other areas not affected by burning. In the long term, the proposed burn treatments would decrease the risk of a large wildfire and improve forest health in portions of the project area, which would, in turn, sustain long-term recreational experiences.

### *Log Hauling*

Short-term changes to recreation opportunity:

- There would be a minor amount of impact from log hauling. This activity would temporarily disrupt or displace recreation activities such as hunting, snowmobiling, and summer camping. Project design features would alleviate the severity of these impacts.
- Noise, dust, and increased traffic on national forest roads would be expected during logging treatments. When the main roads in the project area are being used for logging operations, drivers would experience short delays; weekend and holiday traffic would likely continue as normal, depending on the timing of treatment activities. Some dispersed campsites would be abandoned temporarily with the increased activity along roads. With 7 to 10 trucks per day estimated on haul routes, this impact is expected to be minor.
- Visitors would notice the temporary roads used for hauling, particularly those that were not already in existence. Depending on the ability of barriers to prevent public access, some of the 14 miles of temporary road could be used illegally until they were decommissioned.

Long-term changes to recreation opportunity:

- In the long term, there would be no changes to recreation opportunity from log hauling activities. When temporary roads are obliterated or restored, the potential impact of unauthorized public use would cease.

### *Vegetation Treatments*

Short-term changes to recreation opportunity:

- Short-term effects to all recreation opportunities would involve displacement due to sights and sounds of machinery. Harvesters, rubber-tired and tracked skidders, stroke de-limbers, helicopters, and other equipment would cause continuous noise in the immediate area.
- Dispersed camping opportunities could be directly impacted by treatment operations. This direct effect would be in the short term only, as any dispersed recreation campsites used as log landing areas would be reconditioned to their previous state following operations. Most of the dispersed recreation sites in the project area are located along roads, and most roads in the project area would be affected in some way by implementation of project activities. Therefore, dispersed recreation use can be expected to drop during the project's operational period.

- When implementation activities occur during hunting season, hunting opportunities in the area could be impacted in the short term. These disruptions, however, would be site-specific, and would not occur across the project area at any time. While access to a specific hunting location could be difficult temporarily, other locations in the project area would be unencumbered. In addition to the limitations on hunters' access to hunting grounds, big game species, such as deer and elk, could be affected by the noise and other disruptions associated with logging and burning operations. This short-term impact could lead to the displacement of hunters into other local hunting grounds. This would not only displace the recreationists from their setting of choice, but could also crowd the areas they are displaced into, thereby impacting other hunters.
- There would also be a short-term direct impact on winter motorized recreation opportunities. It is probable that logging operations would cause disruptions to some snowmobile routes during the winter season. These disruptions would be temporary and site-specific; they would not occur in all of the project area at once. In addition, as operations are likely to be conducted during the week, weekend and holiday use of winter routes would likely be able to proceed with minimal disruption. As with the hunter displacement discussed above, displacement of winter motorized recreation activities would negatively impact both the users that are being displaced as well as the users of other snowmobiling areas where they are being displaced to. Resource protection measures would mitigate these effects.
- The current outfitter may have to adjust or restrict guided services during the life of the project. The level of severity this would impose is dependent on the suitability of reroutes around active units and amount of logging traffic on the roads utilized. The Forest Service would work with the business owner to provide alternatives when needed, which could reduce effects.
- The vegetation treatments would cause temporary, but not permanent, changes in some areas designated as SPNM and SPM ROS. The objective of low to moderate interaction between visitors and predominately natural-appearing environments would not always be met because some operations would involve encounters with crews and equipment and short-term visual changes. There are also temporary roads proposed in SPNM, which would temporarily change that setting, because typically no motorized use is allowed. Because of the low amount of acres involved and because the temporary road prisms would be restored, this would be a minor effect, lasting as long as the life of the project.

Long-term changes to recreation opportunity:

- Long-term effects to recreation would result from changes to the appearance of the units following the activities. These changes could be perceived as beneficial or negative, depending on the viewer. The vegetation management activities could create favorable conditions for dispersed recreation and enhance hunting experiences for some.
- While the short-term direct effect on hunting opportunities could be negative in some portions of the area, the long-term impact on hunting is expected to be positive. Increasing forest health would likely have a positive impact on browse and forage production for big game species.
- Vegetation treatments that create openings along open system roads may invite new dispersed campsite creation where topography allows. In addition, openings could also

encourage unauthorized routes off the system roads. The level of impact is dependent on how well this use can be discouraged by natural barriers.

- The ROS would not permanently change due to vegetation treatments. The areas where the larger openings are proposed (in the Sunlight Ski Area boundary) are classified rural ROS, where the environment may be substantially modified. The larger openings, in particular in Unit 201, would appear unnatural to viewers for many years; however, this is not expected to cause changes in recreation use patterns.
- In the long term, alternative 2 would create more diverse and sustainable forest stands in the area, which would help the forested landscape be more resilient, and therefore, more scenic and accessible for a variety of recreation uses.

#### *Sunlight Ski Area Forest Health:*

Forest health treatments would also improve public safety by removing hazard trees and promoting resilience in existing stands. In the short term, summer users in the area could be affected by the sights and sounds of machinery, and the smell of smoke when using trails in the area or when driving NFS Road 300.2F. Since only up to 20 acres would be treated annually, the impacts are expected to be minor.

#### *Sunlight Communication Site Treatments/Borrow Source Expansion:*

No impacts to recreation are expected from these proposed treatments and activities.

#### *Recreation Enhancements/Associated Activities:*

Long- and short-term changes in recreation opportunity:

- In the Sunlight Ski Area, glading would allow for a more diverse and interesting ski experience for intermediate ability level skiers and snowboarders. Because glade skiing generally requires more skills than open-terrain, this would expand opportunities for some visitors. Gladed areas would also allow for more powder skiing. Traditional terrain would remain available for others who did not wish to ski gladed areas.
- Creation of a small parking lot would allow for long-term improvements in congestion and public safety over the current situation. With a parking lot size that can only accommodate 10 vehicles, it is likely that some roadside parking would still occur during popular times.
- The short snowmobile route that would separate motorized and non-motorized users on NFS Road 300 would alleviate conflicts and improve public safety. This is contingent on the snowmobiles using the route.
- The relocation of the existing gate would allow for increased recreation opportunities and would disperse those visitors collecting trees in a more efficient manner, reducing current concentrated-use impacts.

## Cumulative Effects

### Alternative 1 – No Action

Analysis of cumulative effects on recreation considers the effects of past, present, and reasonably foreseeable future activities on the recreation opportunities within the project area. Past and ongoing activities include timber harvesting, prescribed burning, road and trail maintenance, recreational use, and private land development. No past or future actions would result in a

cumulative effect. However, by not addressing the fuel loading and forest health issues, increased risk of large wildfires and continued insect infestation may eventually impact opportunities for recreation as discussed above.

### Alternative 2 – Proposed Action

Past and ongoing activities include timber harvesting, prescribed burning, road and trail maintenance, recreational use, and private land development. No past, current or future actions would result in a cumulative effect to recreation.

## Forest Plan Consistency

Both alternatives are consistent with Forest Plan direction for recreation, though the proposed action would better allow for increased forest resilience and health, which would allow for quality recreation experiences into the future. This responds to Forest Plan Goal 2, Objective 2c.

# Scenery

The objective of this scenery resource section is to describe the scenic environment and to evaluate the proposed action in the County Line Project Environmental Assessment (EA). This scenery section provides a description of the methodology, assumptions, and conclusions in preparing this scenery resource assessment. The process of developing the proposal for this project is documented in other sections of the planning record, of which, scenic resource considerations were an integral part. This section also includes a discussion of the potential effects of the proposed alternative.

The goal of the Scenery Management System is to create and maintain landscapes having high scenic diversity, harmony, and unity for the benefit of society, in general. The existing landscape character reflects influences of natural processes and human activities. Changes in landscape character are managed by the Forest Service using Scenery Management System objectives. Project activities have the potential to affect scenic quality, landscape character, and desired scenic condition in the project area.

The analysis indicators used to determine if thresholds have been exceeded are scenic integrity objectives (SIOs). SIOs provide measurable standards to assess the scenery resource based on the landform characteristics and the level of public concern, and are established by incorporating scenic resource elements: variety class, viewing sensitivity, and distance zone. Scenery will be measured by whether SIOs are met in the *short term* and *long term,* and the design features needed to meet the SIOs. SIOs for the County Line project area range from moderate to very low. In providing a measure by which to describe scenic effects, these objectives include:

- **Moderate:** Changes in the landscape may be evident to the casual observer, but appear as natural occurrences when contrasted with the appearance of the surrounding landscape.
- **Low:** Changes in the landscape appear very evident, but incorporate natural patterns of form, line, color, and texture when contrasted with the appearance of the surrounding landscape.
- **Very Low:** Changes in the landscape appear highly evident and may visually dominate the surrounding landscape, yet when viewed in the background distance, these activities appear as natural occurrences.

## Resource Description

The County Line project area is accessed from the Fourmile Road (County Road 117 and NFS Road 300) and from Sunlight communications site access road (NFS Road 318). The north project area boundary is the Sunlight Communications Site and Sunlight Ski Area, and the west and east boundaries are variable with the southern edge being just south of the Sunlight to Powderhorn Snowmobile Trail and pipeline near Haystack Gate and Middle Thompson Park. The project area contains multiple resource management (motorized and dispersed recreation, wildlife, timber, fuels, range, oil and gas, and scenic resources). The vegetation in the area is composed of aspen, lodgepole pine, Engelmann spruce/subalpine fir forests, mountain shrub and open parks consisting of grasses, forbs, and wildflowers. The County Line project area is in a high-altitude environment with short growing seasons. Revegetation in this environment may be more challenging due to the high elevation and harsh winter climate.

Changes to the landscape have occurred from fire, timber harvesting, range management, and recreation activities. Oil and gas exploration is ongoing. There are several facilities associated with natural gas development including pipelines, storage facilities, and other facilities associated with natural gas development. Other developments include ditches, a gravel borrow source, range structures, recreation facilities, and some private inholdings. The scenic resource may be impacted immediately (implementation to 2 years), in the short term (2 to 10 years) and in the long term (10 or more years). The duration of impact is highly dependent on the vegetation type and how quickly revegetation of disturbed areas occurs.

## Direct and Indirect Effects

### Alternative 1 – No Action

Under this alternative, current management activities and other ecological processes would continue. The project area would be managed to protect and maintain existing improvements and uses. Commercial harvest and non-commercial vegetation management activities would not occur in the project area. There would be no temporary roads constructed for timber harvesting access. There would be no prescribed fire, fuels reduction or wildlife habitat improvement activities. Occasional fires may occur without harvesting activity. There would be no recreation enhancements implemented. The existing gate would not be relocated. There would be no forest health assessments, vegetation management treatments or glading improvements at Ski Sunlight. There would be no borrow site expansion to the existing borrow site. Current management activities and the interaction between natural processes and human impacts would continue under a no action alternative. The project area would be managed to protect and maintain existing improvements and uses. General human uses in the area such as winter and ski area activities, motorized and non-motorized and year-around dispersed recreation, wildlife viewing, livestock grazing, scenic viewing, hunting, fuelwood gathering and Christmas tree harvesting would continue unchanged. Scenic quality would remain in its current condition throughout the area and scenic character may change in the long-term from natural processes, livestock, and human impacts.

### Alternative 2 – Proposed Action

In general, the longest lasting scenery impact comes from color contrast from soil disturbance, generated from tree removal, or from unnatural-appearing edges created from management activities. The area that could be directly affected is the project area. The area that could be indirectly and cumulatively affected is the project area and any area outside the project area from which proposed management activities can be seen. The project area is mostly visible in

foreground and limited middleground views within the project area along roads including from County Road 117, NFS Road 300, and NFS Road 318, local roads, trails and snowmobile trails in the project area. Management activities can affect the scenery resource because of contrasts created between natural forest landscapes and those modified by management activities. These contrasts consist of changes in form, line, color, and texture of the activity area and adjacent landscape.

**Proposed Action:** This alternative includes the following proposed project components: (1) vegetation management, (2) fuels management and wildlife habitat improvements, (3) fuels reduction at Sunlight communications site, (4) forest health treatments and assessments at Sunlight Ski Area, (5) glading treatments at Sunlight Ski Area, (6) winter recreation improvement, (7) relocation of existing gate, and (8) borrow source expansion. The proposed project components would affect the scenery as discussed below:

**1) Vegetation Management**

The type of vegetation treatment used also contributes to the scenery impact. The scenic impact increases where evidence of vegetation management activities such as slash, stumps, rootwads, landings, skid trails, roads, landings and paint are evident in foreground views and opportunities to minimize scenic impacts are greater where slopes are less steep and unit size and shape can be manipulated more effectively for road construction.

The proposed group selection and aspen coppice cuts would be laid out with irregular shapes and with feathering on the edges where feasible, making treated areas appear more like natural openings. The vegetative mosaic in this area has many naturally occurring large open parks, which would assist with blending into the existing vegetation mosaic. In the proposed individual tree selection, the tree removal may not be very noticeable except for the low stumps in foreground. The stands would appear healthier and less dense with the removal of trees with poor form. After the vegetation treatment activities, the scenic quality would be temporarily diminished from its existing natural appearance. Initially and in the *short term,* the coppice and group selection openings may be more noticeable due to the bare ground and some slash scattered throughout the units. As new vegetation emerges, and young trees become noticeable, the bare ground would turn green and be less noticeable. The openings would have a positive effect on the vegetative mosaic. In the *long term,* the vegetative mosaic would be varied with different sized natural-appearing openings and diversity in stand character, species, and age class. The texture and canopy of the stands would have variety and diversity. The young trees would become established, reducing the color contrast with adjacent forested areas. The emerging forest would achieve a mature height after several years and the color contrast of the stands would only have textural differences. Edge lines forming the boundary of the harvested areas would become less noticeable. Many of the units are in a forgiving landscape due to the varied vegetation mosaic and diverse vegetation types including the mixed conifer and aspen forest, meadows, rock outcrops, talus slopes, and open parks, which contributes to the landscape character of this area.

Road and landing construction can involve noticeable alteration of landforms and may leave very long-lasting scenery effects on the landscape. The closure of roads can help minimize the *long-term* scenery impacts. If logging operations are suspended when ground conditions are such that excessive damage would result, it would prevent unacceptable damage to the soil and water resources and minimize the negative scenic impact in the project area.

The new temporary roads would be decommissioned upon completion of harvest activities and rehabilitated. Some existing temporary roads would remain for future administrative use, and would continue to be closed for public use. A combination of techniques would be used for decommissioning including recontouring the new temporary roads to as near a natural appearance as possible by resloping drainage crossings, constructing waterbars, pulling in or rounding the backslope where practical, ripping of the travelway 12 to 18 inches deep, slashing the travelway where practical, and revegetating with native seed. There may still be evidence of the old temporary road platforms and the skid trails, but the scenic impact of the decommissioned temporary roads would diminish over time as they revegetate, minimizing the *long-term* scenery impacts.

**2) Prescribed Fire and Wildlife Habitat Improvements**

Using hand and aerial ignition to accomplish prescribed burning would help create a natural-appearing vegetative mosaic. Hand-constructed fire lines, natural barriers, and wet lines would minimize the scenery impact. After the fuels treatments are completed, there would be a *temporary initial* scenic impact of no more than a week from the smoke generated by the fire, the majority of it the day of the burn. There would be dead charred material in the units in the *short term*. A nutrient flush generated from the fire and new ground cover consisting of grasses, forbs, and wildflowers would appear the first season with a bright green color. The aspen and shrubs would re-sprout and the grasses would grow back within the first or second growing season, reducing the contrast of the burned area with the live vegetation. Each new burning season would create an area of dead charred material in the units burned that year. After a unit is burned, re-sprouting vegetation would reduce the contrast of the burned area and the live vegetation. The resulting vegetation would have more vigor than the existing densely stocked aspen and shrub cover creating a healthier landscape and wildlife habitat improvement for the *long term*. Design features are incorporated into the design of the project to lessen the impacts of hand control lines. The prescribed burning should result in achieving the characteristic landscape meeting the Forest Plan direction.

These prescribed fire units would be visible from County Road 117, NFS Road 300, local roads, trails in the area, and Sunlight Ski Area. The effect on the existing landscape character, scenic quality, and scenic integrity levels would be noticeable to the casual forest visitors during the *short-term* timeframe as they travel through the area along the roads and trails or within the ski area. People familiar with the area, such as residents and frequent visitors, would be more aware of the activities and scenic alteration to the vegetation in the landscape. The occasional visitor would not be as likely to be aware of the change. The *short-term* effect is expected to alter the existing condition in various vegetation mosaic patterns to intermittent areas of burned aspen and shrub branches and trunks and grasses. Patches of bare ground and intermittent fire lines may also be visible in the foreground and some middleground views. Such *short-term* effects may appear to be a dramatic alteration, ranging from major to negligible, depending on how much is implemented each year. This is compared to the existing condition for local residents and casual visitors and would be noticeable until the prescribed fire area recovers from the treatments. It is anticipated that the proposed treatments are located in good growing sites and recovery may be up to five growing seasons or more. Each year, a new area would be implemented, so there may be a range of area recovery that would contribute to the overall vegetative mosaic and scenic improvement.

The *long-term* effects are expected to be of considerable enhancement and beneficial to the landscape character, scenic quality, and scenic integrity levels as vegetation treatments are expected to improve vegetation health, shrub vigor and enhance vegetation components across the landscape, which also have a benefit to wildlife for forage and cover. The dominating black, brown, and gray color in the project area would decrease and change to variations of green in the spring and summer. The fall color would be improved for a healthy stand condition. The scenic integrity for the area would improve as the diversity in type and structure of vegetation changes respond to the reduction in fuels and creation of openings consisting of grasses, forbs and shrubs and the aspen incorporated into the foreground and middleground views.

**3) Fuels Reduction at Sunlight Communication Site**

The existing site is a relatively flat site with open meadows on top of a mountain with trees and shrubs around the perimeter. Many of the communication structures are already in a meadow with some located in the trees. The selective tree removal would only be noticeable when on site in the foreground and limited middleground views. This area is not open to the public and is only used by the permittees with communication site equipment. The removed tree stumps would be cut as low as possible for safety. *Initially*, the removed vegetation would be noticeable to the permittees using the site, and some of the equipment would be slightly more prominent if vegetation is removed.

Hand-cut vegetation would be piled and burned (avoiding large piles) or chipped and dispersed. Chipped material would be 3 inches or less, graying and disintegrating over the *long term*. The scenic impact of slash piles would be *short-term*, as the materials would be disposed of and/or burned. Once the debris is disposed of, fuel treatment areas may appear natural to the casual observer after a few seasons. Burn piles may take longer to revegetate due to the higher burn temperatures. Over the *long term*, the scenery impact of the fuels reduction treatments would be minimal, and the site would appear a bit more open with the effect of a larger meadow area.

**4) Forest Health Assessments and Treatments at Sunlight Ski Area**

The vegetation at the ski area is composed of 92 percent aspen stands or aspen stands with mixed conifer. The remainder of the forested area is composed of spruce and fir stands. The small amount of vegetation treatments each year would be spread over several years of implementation, so the scenery effects would be *minimal* and slightly noticeable to the average user of the Sunlight Ski Area. The scenery effects of the proposed treatments are described below.

Removal of hazard trees along ski runs or lift corridors to protect infrastructure may widen the opening a bit, but would be slightly noticeable. The stand would have a healthier appearance with the hazard trees removed. This would provide an opportunity to feather the edges of the ski runs and lift corridors, which would soften some of the hard linear edges and improve the scenery.

Planting seedlings or transplants to speed up vegetation growth in key areas would contribute to a more diverse age class in the stands and improve the scenic diversity of the stands.

Insecticide or pheromones application to prevent bark beetle attacks would not be noticeable from a scenery perspective, except that it would contribute to a healthier stand.

Protection of young regeneration from skier damage in 0.5-acre or smaller tree islands would contribute to a more diverse age class in the stands. This would improve the scenic diversity of the stand.

Burning or removal of logging-generated slash to reduce fuels would initially be piled and burned or removed from site. The scenic impact of slash piles would be temporary, as the materials would be disposed of and/or burned. Once the debris is disposed of from the site, the area would appear natural to the casual observer. Burn piles may take a season or two to revegetate due to the high burn temperatures of the piles. This would have a *short-term* impact on the scenery, and would not be noticeable *long term*.

**5) Glading Treatments at Sunlight Ski Area**

The gladed areas would be visible in foreground and middleground views on the ski area and from County Road 117. The amount of vegetation removal proposed would have limited effects on existing scenic character. The proposed glades would be similar to the areas of existing natural glades and be a *minimal* scenery impact. Glading techniques would retain the age and species class diversity of existing tree stands, which would limit the scenic impacts of proposed vegetation clearing.

**6) Winter Recreation Improvements**

The proposed parking area would be a minimal change from current condition except for a small area that would be graded for 5 to 10 vehicles and some signing would be provided. The parking area is located within an aspen coppice unit so some aspen would be removed around where the parking area is located. This would provide an opening and would blend with the existing vegetative mosaic and natural open parks nearby. See tree removal scenery effects in #1 above in the Vegetation Management Section.

The proposed 0.36-mile snowmobile trail reroute would have *minimal* scenery impact. It would be located off the NFS Road 300 Road near the proposed parking area, and partially located within the proposed aspen unit discussed above. The aspen would be cleared around the proposed trail location.

The parking area and snowmobile trail reroute would allow better control of site impacts of vehicles and snowmobiles. The parking area would assist with minimizing site hardening in areas outside the designated parking area. This is a winter use site that would be plowed in the winter. The site improvements would enhance the experience for users and would be a welcome addition to the area in the *short term* and in the *long term*. The scenery impacts would be *minimal* for these recreation site improvements.

**7) Relocate Existing Gate**

Only regular users of the area would notice the existing gate relocation. It would provide better winter access farther up the road. The gate relocation would be a *minimal* and positive effect to scenery.

**8) Borrow Source Expansion**

The proposed expanded borrow source would be no more visible to users of the area than the existing borrow source, even though it would triple the size. Some trees would be removed where the expansion occurs, but it would be adequately screened to *minimize* scenery impacts. Most of the trees surrounding the existing borrow source would remain for screening. The borrow source would be visible from NFS Road 300 just at the entrance, which is the current situation. The existing gate would remain in place to control vehicular access to the borrow source. The scenery

impacts of this borrow source expansion would be *minimal* and similar to the existing condition at the site. There are no future plans at this time to re-contour and revegetate the borrow source due to the continued use.

## Cumulative Effects

**Past Actions:** The County Line project area has been managed for cattle grazing, wildlife habitat, natural gas production, communication site facilities, timber harvesting, borrow source, fuel wood gathering, Christmas tree collection, ski area, and a variety of recreational activities. Many roads remain from past harvesting, natural gas production, gas pipeline corridor, communication site, recreation activities, and a borrow source within the project area. The old road platforms, which were not recontoured, and evidence of these closed roads would be apparent to users of this area for many years. Evidence of previous timber harvesting activities includes roads, skid trails, landings, stumps, rootwads, and paint on trees in the area adjacent to where sales have occurred in the past. Evidence of cattle grazing activities includes fences and range trails. Evidence of recreational activities includes dispersed campsites and hunting camps, motorized trails (snowmobile and ATV), non-motorized trails, big game hunting (bow, muzzle loading and rifle), and downhill ski runs and the associated infrastructure. There is evidence of dispersed camping in compacted use areas with minimal vegetative cover. Previous wildlife and cattle grazing, recreation, natural gas and gas pipeline, communication site facilities and timber harvesting activities are factors, which affect the existing scenic integrity. The number of human-made disturbances may have an impact on the visitor experience for the users who visit this area. There is evidence of humans throughout the project area.

**Concurrent Actions:** Management activities, which are taking place at the present time, are a continuation of existing use including a variety of year-round recreational activities, Sunlight Ski Area, fuel wood gathering, Christmas tree collection, cattle grazing, natural gas production, Sunlight Peak communication site activities, wildlife habitat, and timber harvesting. No active fuels projects or timber sales are under contract in the analysis area, although several have occurred in the last 20 years. Based on the alternatives analyzed in detail, nothing is considered to be a significant scenery impact when combined with concurrent and past actions. The scenery impact analysis of the proposed alternative is based on the design features being implemented. The cumulative effect of the concurrent actions would be to maintain the scenic quality of the project area landscape over the *long term*.

**Anticipated Actions:** The project area would be positively affected by changes in vegetation to increase the species and age class diversity and to improve forest health throughout the area using the various vegetative prescriptions and fuels treatments. The overall scenery effect, *long-term* scenery and scenic improvement of the vegetation due to the increased species diversity and improved vegetation health would create a more visually pleasing vegetative mosaic. The ski area recreational and safety improvements would create a better user experience. Year-round recreation activities would continue with the potential for increased use. Christmas tree collection would continue. Natural gas activities, borrow source activities, communication site activities and cattle grazing would continue in the area. There are no additional timber sales in the White River National Forest 5-Year Action Plan for this area.

Based on the past, concurrent, and anticipated actions discussed above and the proposed action analyzed in detail, the cumulative effects of the activities in the area would not raise the scenery impact to a significant level.

## Forest Plan Consistency

The Forest Plan allows some disturbances related to scenery in managed areas, as long as the alterations meet the adopted SIOs. SIOs adopted in accordance with the Forest Plan represent guidelines, which should be met wherever possible. The proposed action alternative has been designed to meet the SIOs set by the Forest Plan standards and guidelines.

### Conclusions

The proposed vegetation management activities and fuels treatments would be visible within the project area and may create some temporary scenery impacts in the *immediate* and *short term*. The degree of scenery impact would vary by treatment type and distance from viewers. They would improve natural-appearing scenic characteristics in the *long term*. The potential direct, indirect, and cumulative effects of the proposed activities to scenery resources would be consistent with Forest Plan direction for scenery objectives *long term*. All management activity associated with alternative 2 in the County Line Project would meet Forest Plan direction and have a positive overall effect for scenery resources in the *long term*.

# Soils

Soil concerns typically raised from timber sales include compaction, displacement, and erosion from heavy equipment associated with logging, loss of soil organic matter and nutrient pools from biomass reduction, and increased risk of mass movement from changes in site stability and soil moisture content. These concerns frame the template for indicators that serve as the focus of this analysis and design features to minimize the impacts to soil resources of the project area.

It is through the lens of the following issues and indicators that effects to soil and geologic resources from the proposed vegetation removal in the County Line Project are considered in this analysis:

*Issue 1 - Soil Compaction* – qualitative (ocular estimates of platy structure) or quantitative (penetrometer measurements of resistance) estimations of impaired soil structure from tracked and wheeled vehicle traffic associated with timber sale activities.

*Indicators:*

- Acres of landings
- Miles of multiple pass skid trails
- Miles of roads – temporary and permanent

*Issue 2 - Soil Displacement, Soil Erosion and Landscape Stability* – Visual signs of erosion (rilling/gullying, pedestalled rocks and plants, deposition of soil on uphill side of rocks and plants) or larger mass-wasting features (scarps, slumps, landslides).

*Indicators:*

- Acres of landings
- Miles of multiple pass skid trails
- Miles of roads – temporary and permanent
- Acres of high-intensity fire

*Issue 3 - Loss of Organic Matter/Decreased Soil Productivity* – comparison of pre-harvest depth of soil O and/or A horizons to post-harvest levels of organic matter and nutrients should be equal; if it is not equal, there would be a loss in organic matter, and in response, a decrease in soil productivity. Recruitment of coarse woody debris would provide nutrients as it is expected that decomposition would occur over time in the activity area.

*Indicators:*

- Acres of landings
- Miles of multiple pass skid trails
- Miles of roads – temporary and permanent
- Acres of high-intensity fire

## Resource Description

Management goals for the soil resource are to maintain or enhance long-term soil conditions at acceptable levels that allow the soil to function in a desirable manner. To do this, it is desired to maintain or improve soil organic matter and nutrients on the landscape. The extent of detrimental soil disturbances would be minimized through the application of management requirements and project design features designed to minimize, avoid, or eliminate potentially significant impacts, or by rectifying impacts in site-specific areas with restoration treatments. Soil hydrologic function is ensured by retaining adequate supplies of surface organic matter and coarse woody debris without compromising fuel management objectives. After all actions on roads and disturbed sites are finished, it is expected that the sites would be reclaimed to prevent soil resource damage.

Soils background data for the County Line Project were provided from the Holy Cross Soil Survey (USDA Forest Service, unpublished data). Timber harvest operations with mechanized equipment affects soil characteristics including organic matter content, erosion risk rates, texture, bulk density, depth, and drainage.

Most soils within the analysis area have developed in colluvium or alluvium derived from weathered sedimentary rocks of the Wasatch formation (claystone, shale, and sandstone). Many of the soils mapped for the project area are Mollisols and Alfisols that possess the favorable soil properties such as high organic matter and nutrient levels. There are few soils that are Inceptisols, which have 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 minimally susceptible to deep compaction, but are sensitive to ground-disturbing activities that impact protective ground cover and/or the surface layer of soil. The soils in the County Line project area are moderately deep and have silty loam surface textures. Additionally, most have thin surface layers and moderate to high water- and nutrient-holding capability. These sites are not usually highly susceptible to deep compaction, but surface compaction of highly traveled areas has been observed on similar soils in other project areas.

## Direct and Indirect Effects

### Alternative 1 – No Action

Under the no-action alternative, timber harvesting and associated road construction would not occur, precluding any potential impacts to soil and geologic resources from these activities. Analyzing the potential effects from fuel buildups and subsequent fire from not actively managing vegetation in this area is beyond the scope of this analysis.

## Alternative 2 – Proposed Action

Effects to soils from timber harvesting activities are well-documented and the body of research literature is largely coincident with the issues and indicators that are the focus of this analysis: soil compaction, productivity losses, and erosion following logging. An overview of these issues as they relate to the proposed action follows.

### *Soil Compaction, Displacement, and Erosion*

Soil compaction is caused when there is a decrease in pore space volume, the gas- and liquid-filled voids between mineral grains and/or organic matter in a given mass of soil. When pressure is exerted downward on soil from logging and hauling equipment, the pore structure through which roots, water, and nutrients pass collapses, ultimately reducing vegetative growth and vigor. Detrimental soil displacement occurs when soil is removed from a continuous area of 100 square feet or more. When there is any indication of sheet erosion or any rills or gullies greater than 1 inch, there is detrimental erosion occurring in a unit.

**Landings and skid-trails**

- Conventional ground-based logging systems would be used for removing trees, creating multiple pass skid-trails and landings. Logging activities (cutting, felling, and yarding) may occur year-round as weather and ground conditions allow.

Detrimental compaction, erosion, displacement, and removal of ground cover, and increased potential for erosion are expected to occur on skid-trails and landings where multiple passes with heavy equipment occur. There is no current acreage of landings and ski-trails, but generally, a designated landing and primary skid-trail system is expected to cover between 12 to 25 percent of an activity area. These effects are considered to be short-term, because they are mitigated through restoration activities such as de-compaction, lopping and scattering slash, and seeding. Some off-designated skid-trails heavy equipment operation is necessary to get to trees within the units. In clearcut and coppice units where tree density and/or treatment intensity is high, many passes and turns may cause minor ground disturbance over as much as 40 to 50 percent of the activity area. Low to moderate compaction and increased potential for erosion commonly occurs, but these areas are generally small, isolated, and discontinuous. The degree and extent of impacts are highly dependent on treatment intensity and ground conditions during the implementation period. Natural recovery of the landings, skid-trails, and off landing/skid trail areas would occur through restoration and re-establishment of natural accumulation of woody debris over time.

Overall, soil compaction and displacement from the proposed action of harvesting timber on approximately 1,597 acres within the boundary of the County Line project area is expected to be minimal; this owes to the favorable soil properties and adherence to Forest Plan standards, guidelines, and design features. High levels of soil organic matter and rock fragments offset compaction risk in the finer-textured (clay and silt-rich) soils found in the claystone, shale, and sandstone soils of the project area. Compacted landings, temporary roads, and compacted portions of skid-trails would likely comprise less than 15 percent of the activity area. Compaction and displacement may occur in less traveled parts of the activity area if operations occur when soil is wet. Operating over a protective layer of packed snow and/or frozen ground may help prevent compaction, but monitoring of similar projects indicates that it is unlikely that snow cover or frozen ground would remain over the entire implementation period, particularly on south-facing slopes. Design features incorporated into this project would further mitigate against potential detrimental soil impacts.

From a geologic hazards perspective, gentle slopes and predicted low risk to site stability on this given landscape deem the County Line project area ideal for logging operations. Timber harvesting temporarily reduces forest cover, and consequently, decreases the interception and transpiration of atmospheric moisture (USDA Forest Service 2010). The subsequent effects to soil erosion and water yields vary according to precipitation regime, the amount of canopy removal, and underlying soil compaction.

Given the fine-textured nature of some of the geology found in the County Line project area (claystone, shale, sandstone), erosion potential increases in subsoil horizons underneath the more resilient topsoil (A and/or O) soil horizons. Erosion may occur during snowmelt or any other runoff event, and high-intensity storms give way to the greatest potential to cause erosion. Erosion potential would increase during and following project implementation due to removal or disturbance of the litter/duff layer and/or vegetative ground cover.

### Road actions

- Construct 4.2 miles of new temporary road.
- Obliterate 4.2 miles of new temporary road following harvest activities.
- Use of 10.6 miles of temporary road that has an existing road template in place.
- Some temporary roads used are determined by the White River Travel Management Plan as not needed or decommissioned—these roads would remain decommissioned after harvest.

Creating 4.2 miles of new temporary road and using a total of 10.6 miles of temporary roads would create additional soil displacement and compaction within the watershed. Over construction and use period, erosion from these road surfaces could occur in response to snowmelt and thundershower precipitation/runoff events, but would be limited by effective road drainage and other best management practices. Reclamation of temporary roads and other disturbed sites and improvements to the permanent road system should offset some of the increases in soil erosion, sedimentaion, and runoff that accompany transporation corridors through the project area. Post-treatment measures such as lopping and scattering of fine slash and water-barring skid trails would also decrease the risk of soil erosion.

### Recreation enhancements

- Construct a parking area for winter non-motorized users of NFS Road 300. The parking area would accommodate 5 to 10 vehicles. Create a snowmobile route approximately 0.36 mile long that would reduce conflicts along Road 300.

Creating a parking area would create intentional bare ground, causing soil displacement and compaction where the parking area would be. Erosion from the parking surface could occur in response to precipitation/runoff events, but would be limited by using effective engineered drainage and best management practices. The proposed parking area is a small footprint with impacts on soils; however, it is needed for recreational purposes. To avoid further soil impacts, best management practices, project design features, and mitigation would take place.

#### *Loss of Soil Productivity*

In the group selection and individual tree selection units, the proposed activities have low potential to detrimentally impact long-term nutrient cycling processes because some trees would remain following treatment, providing material for recruitment of large downed wood, fine slash, or needle cast. Recruitment of material for decomposition is expected to occur naturally over time

in these activity areas. The potential for nutrient cycling impacts in coppice areas is higher because more vegetative material is removed. However, provided retention of adequate amounts of large downed wood and fine slash occurs, effects to long-term nutrient cycling would be low. Temporary road construction would cause local loss of soil organic matter and nutrient cycling, but following harvest, roads would be obliterated and retention of course woody debris would aid in the recovery of long-term soil productivity.

The ability of the soil to function as a substrate for future forest growth (soil productivity) is unlikely to be hindered under the proposed action. Long-term nutrient cycling in the proposed activity areas is dependent on a continual supply of slash and large downed wood for decomposition. Project area soils are relatively sensitive to ground disturbance and other impacts to nutrient cycling because a high proportion of their productive capacity is based on the nutrient-rich surface layer. Management and policy directives that provide for retention of specific levels of coarse and fine woody debris following timber harvest should help provide for adequate supplies of nutrient and organic matter pools on the forest floor. Decomposition of slash and large downed wood is relatively slow due to the local climate; however, leaving the coarse woody debris would aid in soil nutrient availability over the long term and reduce erosion potential post-harvest.

### *Prescribed Fire and Other Fuels Treatments*

- A total of approximately 13,661 acres is proposed to be treated with prescribed fire containing a variety of vegetation types including aspen, grass, and brush/shrub.

Where prescribed burning is proposed, vegetative recovery would be expected to be rapid if burn intensities are low to moderate, with erosion rates typically dropping to pre-fire levels within 2 to 4 years. Hydrologic recovery after fuel treatments also tends to be more rapid than after wildfire or where high-severity fires occur because a smaller proportion of the forest canopy would be removed. Areas with high fuel loadings could experience higher soil burn severity, which could increase the potential for erosion and runoff. Additionally, high soil burn severity areas would take longer to recover following the burn. Through controlling prescribed burns to slopes less than 55 percent and implementing fire for low soil burn severity effects, there would be minimal soil erosion and loss of soil productivity.

## Cumulative Effects

Past actions in the project watersheds that influence the soil resource include timber harvest activities, livestock grazing and associated stock water developments, road construction and maintenance, and recreational uses.

Ongoing activities in the project watersheds that influence soils basically echo those listed previously for past actions.

Reasonably foreseeable actions in the analysis area that could influence soils include timber harvest, prescribed burning to benefit wildlife habitat, continued recreational and outfitter-guide use, and livestock grazing.

Within the temporal and spatial bounds of the County Line project area, a host of land use and management activities have had variable impacts to soil resources of the area. Past timber harvests, transportation and utility construction, grazing by livestock, and recreation have all contributed to minor amounts of localized soil disturbance. Existing soil conditions are likely to

remain relatively stable from the cumulative effects of the aforementioned activities. The additive impacts of selective vegetation removal in the County Line project area are not anticipated to contribute significantly to cumulative effects on soil and geologic resources. In some cases, regeneration of aspen from thinning conifer encroachment may improve soil nutrient cycling through the increase in organic leaf litter (deciduous leaves that fall to the ground), which in turn, breaks down to produce soil organic matter.

### Forest Plan Consistency

Forest Plan compliance for the soil resource is essentially determined by compliance with the management measures in the Water Conservation Practices Handbook (FSH 2509.25), which requires that projects maintain or improve long-term soil quality. Under the proposed action, there are minimal impacts on overall soil quality and adherence to design features and best management practices would allow consistency with the White River National Forest Land and Resources Management Plan. All project activities proposed in the County Line Project do not significantly impact soil processes.

## Transportation

### Resource Description

*Road Maintenance*: National Forest System roads being used for the project that are in good condition would be maintained during the project. Maintenance preserves the function of the road, but typically does not include improvements. Maintenance activities generally include: blading; brushing; removing roadside hazard trees; repairing and/or replacing road surfaces; cleaning, repairing, or installing drainage structures. Road maintenance can assist in ensuring best management practices compliance.

*Road Reconstruction*: Road reconstruction describes work that would improve the existing road conditions as needed for safe and efficient haul of forest products and restore damaged National Forest System roads. Road improvements would be used to provide the appropriate level of service for project haul vehicles and logging equipment, as well as for proper hydrologic function and stream protection in accordance with applicable best management practices. Actions can include but are not limited to: road reconditioning and surface improvement; construction of drainage dips; culvert installation or replacement; and road prism widening to accommodate logging vehicles and equipment. Road reconstruction also includes the actions included in the Maintenance category, including removal of roadside hazard trees.

Temporary traffic control measures would be implemented for public safety in accordance with Forest Service sign policy and the Manual on Uniform Traffic Control Devices.

Forest Service Manuals and Handbooks in the 7700 series (Travel Management) provide direction for planning, maintenance, and operations of the forest transportation system. This project is consistent with that direction.

The planned transportation haul route from the project area would follow the Fourmile Road (NFS Road 300) from the intersection with the Park Creek Road (NFS Road 320) northeast to the intersection with Garfield County Road 117 (GCR 117). The proposed haul route follows GCR 117 to Glenwood Springs and onto Interstate 70.

In its current state, the Fourmile Road can adequately handle loaded log trucks or other commercial traffic under most weather conditions. However, subgrade failures may occur during extended periods of wet weather conditions. When the road subgrade has high moisture content, unacceptable deformation of the road template can occur and make the road impassable to motorized travel. Such failure is most likely to occur in early summer and late fall. All other roads are suitable for dry or frozen haul conditions only. Including safety design features that were successfully used during winter logging of the Sunshine and Haystack/North Thompson timber sales would help to mitigate conflicting use on travel ways.

### Present and Future Transportation Needs for the Area

Natural gas production activities, grazing permittees administering their allotments, and recreationists use the road system in the area. Past commercial activities have included removing forest products from the area. Summer recreational interests include hunting, fishing, camping, horseback riding, bicycle riding, hiking, wildlife observation, gathering of forest products, pleasure driving, and all-terrain vehicle users (ATV, UTV and motorcycle).

Due to natural gas production activities and past timber sales, the area is easily accessed, although travel off of the main access route during wet weather can be difficult. Natural gas production activities are evident in the southern portion of the analysis area. There is a need for Black Hills/Rocky Mountain Natural Gas to access their natural gas wells in the Wolf Creek area year round.

The northern portion of the analysis area is heavily used by recreationists and offers a variety of experiences. The southern portion of the analysis area is primarily used for camping, hunting and fishing.

Past timber activities have included winter haul. Rocky Mountain Natural Gas activities keep portions of NFS Road 300 plowed during early winter or until snow depths are such that they are able to begin snow cat operations.

Winter use seems to be predominantly snowmobile and cross-county skiing, but snowshoeing, dog sledding, and other winter activities also occur. Travel management strategies for the Proposed County Line Project Analysis Area are fully discussed in the White River National Forest 2011 Travel Management Plan. Winter and summer travel management strategies for the analysis area can be found at the Aspen-Sopris Ranger District office or online at http://www.fs.usda.gov/detail/whiteriver/home/?cid=stelprdb5328680.

## Direct and Indirect Effects

### Alternative 1 – No Action

Under the no-action alternative, current management plans would continue to guide management of the project area. No vegetation treatments, timber harvest, road maintenance, or road decommissioning would be implemented to accomplish project goals. Average daily traffic volumes would continue at their current rates, and most likely increase into the future. Road maintenance associated with vegetation management activities improves sight distances and general road conditions, more so than general road maintenance activities performed outside of vegetation management work. On-forest user safety may be negatively affected in the short term as a result of the no-action alternative.

## Alternative 2 -- Proposed Action

The proposed action would include necessary maintenance and repairs on existing permanent roads, and/or construction of temporary roads. Newly constructed temporary roads would be closed to motor vehicle traffic or obliterated following treatment activities.

Road maintenance and reconstruction would improve the forest transportation system within the project area with regard to access and minimizing resource damage. Reducing roadside hazard trees and dead or dying trees within roadside units could improve the level of safety for users of the forest transportation system.

The number of log trucks or chip vans that can be expected on haul routes varies, based on a number of factors including weather, operational restrictions, and equipment issues. However, on average during active operations, 7 to 10 log trucks or chip vans would be expected on haul routes per day (see table ).

**Table 8. Proposed haul routes**

| Route Number | Route Name | Length (Miles) | Maintenance Level* | Unit Accessed | Acres | Estimated Loads** (7-10 per day) | Percent Increase in Average Daily Traffic during haul |
|---|---|---|---|---|---|---|---|
| NFS Road 300.3R | Texas City | 0.8 | 2 | 204 | 99 | 198-297 | 50% estimated |
| NFS Road 300 | Fourmile Road | 10.0 | 3 | All (101-110, 201-211) | 1,597 | 3,723-5,320 | 5% |
| County Road 117 | Fourmile Road – Midland Ave. | 10.2 | County Road Paved | All (101-110, 201-211) | 1,597 | 3,723-5,320 | 0.3% |

*Maintenance Level 2: High Clearance Vehicles; Maintenance Level 3: Suitable for Passenger Cars

** Load Counts are estimates for chip vans or log trucks based on similar projects on the White River National Forest.

## Temporary Roads

Approximately 14.8 miles of temporary road would be needed to complete harvesting activities. Approximately 10.6 miles of these temporary roads have an existing road template in place, and approximately 4.2 miles of new temporary road construction would be needed. All temporary roads would be closed to the public for both motorized and mechanized use while operations are occurring. Following harvesting activities, temporary roads would be obliterated or closed in a manner that discourages motorized and mechanized use in accordance with the White River National Forest Travel Management Plan.

Some temporary roads would incorporate existing roads that the White River Travel Management Plan identifies for decommissioning. A timber sale or stewardship contract would require decommissioning these roads after harvested trees are removed from the treatment unit. Decommissioning may include removing existing culverts, ripping and seeding the roadbed, or restoring and/or improving erosion-control devices within the road template.

**Table 9. Proposed temporary roads**

| Temporary Road # | Route Name | Units Accessed | Length (Miles) | Existing Template |
|---|---|---|---|---|
| NFS Road 300.4A | County Line Road | 101 | 0.9 | Yes |
| NFS Road 300.4C | Old Fourmile Clearcut | 103 | 0.6 | Yes |
| NFS Road N300SP.3 | SP – Park Creek | 109 | 0.2 | Yes |
| NFS Road 301.1 | Beaver Pond | 102-105, 205 | 1.0 | Yes |
| NFS Road 301.1A | --------- | 104, 105 | 0.4 | Yes |
| NFS Road 301.1C | --------- | 102, 103 | 0.3 | Yes |
| NFS Road 301W.1A | MP 5.5 Camp DC Road | 102-105, 205 | 0.2 | Yes |
| NFS Road 301W.2A | County Line Skid Road | 104 | 0.1 | Yes |
| NFS Road 301.2B | Beaver Spur NO. 2 | 103 | 0.7 | Yes |
| NFS Road 301.2C | Beaver Spur NO. 3 | 104 | 1.0 | Yes |
| NFS Road 320.1 | Park Creek | 109, 110, 211 | 2.0 | Yes |
| NFS Road 320.1A | Park Creek Spur #1 | 109, 211 | 0.5 | Yes |
| NFS Road 320.1B | Park Creek Spur #2 | 110 | 0.4 | Yes |
| NFS Road 332.1 | Lower Clearcut | 102, 103 | 0.8 | Yes |
| T1 | --------- | 201 | 0.4 | No |
| T2 | --------- | 202 | 0.3 | No |
| T3 | --------- | 203 | 0.3 | No |
| T4 | --------- | 102-105, 205 | 0.1 | Yes |
| T5 | --------- | 102, 205 | 0.3 | No |
| T6 | --------- | 104, 105 | 0.2 | Yes |
| T7 | --------- | 102 | 0.4 | Yes |
| T8 | --------- | 106, 107, 210 | 0.5 | No |
| T9 | --------- | 106, 210 | 0.3 | No |
| T10 | --------- | 210 | 0.2 | No |
| T11 | --------- | 108, 207-209 | 1.2 | No |
| T12 | --------- | 207 | 0.1 | No |
| T13 | --------- | 108, 207 | 0.2 | No |
| T14 | --------- | 108 | 0.1 | No |
| T15 | --------- | 109 | 0.2 | Yes |
| T16 | --------- | 109 | 0.3 | Yes |
| T17 | --------- | 211 | 0.2 | No |
| T18 | --------- | 109, 211 | 0.2 | No |
| T19 | --------- | 110 | 0.2 | No |
| ---------- | | ---------- | 14.8 | ---------- |

The existing gate at the Road 300 kiosk would be relocated approximately 1.5 to 2 miles south on Road 300. The exact gate location would be determined based on existing topography adjacent to the road surface. The gate would be closed on November 23, in accordance with the White River National Forest Travel Management Plan.

Project implementation could involve a short-term increase in traffic.

On some roads, administrative use is expected outside the current allowed public use seasonal provisions for project implementation. Upon completion of the proposed vegetation treatments, all roads would continue to be managed per current travel management direction.

### Material Source

An existing material source (aka County Line Borrow Source) located along NFS Road 300 at mile marker 7.5 would be used to maintain and repair existing roads within the project area.

Expanding the developed area of the County Line Borrow Source (see figure 10) would allow further production of rock material for use in maintenance and reconstruction of roads and other facilities. Subsurface investigation by drilling or other means would be used to assess the quality and volume of material available for long-term needs. It is anticipated that approximately 30,000 cubic yards may be excavated and removed over a period of 10 to 20 years. The site would also be used to store stockpiled material for use as needed. The area of surface disturbance would increase from the existing approximate 1.5 acres to approximately 4.6 acres. Vegetation removal would include grass, shrubs, and some standing timber. Access to the borrow source is directly from Fourmile Road 300.3. The existing gate would remain in place to control vehicular access to the borrow source.

## Cumulative Effects

There are no known reasonably foreseeable actions expected to occur in the project area that would have additional impacts to known transportation resource. In addition, there are no recently completed projects that adversely impacted the transportation resource. Therefore, no further impacts to the transportation system within the project area are expected to occur.

## Forest Plan Consistency

The proposed action is consistent with the components of the White River Forest Plan.

### Forest Plan

The White River National Forest Land and Resource Management Plan - 2002 Revision (Forest Plan), as Amended provides the overall direction for managing transportation on the White River National Forest, including meeting national strategic goal and objectives applicable to this project: (Forest Plan, pages 1-14)

The Forest Plan also provides the overall direction for managing transportation on the White River National Forest, including meeting the Travel System Infrastructure Forest Wide Standards and Guidelines applicable to this project (Forest Plan, pages 2-39, 2-40).

The Forest Plan includes management area prescriptions with specific standards and guidelines for particular areas. If a specific resource is not addressed in a management area prescription, this indicates that the forest wide standards and guidelines provide adequate direction. In addition, Federal and State laws and regulations and the Forest Service Directives System always apply, although they are not specifically identified in management area direction.

Segments of six White River National Forest management areas are located within the County Line Project analysis area. Three of the management area segments contain units or access routes to units. Two of the management areas have road density requirements.

### *Road Density*

Road density is calculated by dividing the miles of road or trail open to motorized use by the square miles in a unit (Habitat Area) within a management area. The following illustrates the current road density for the two management areas located within the proposed project area with road density criteria. Data are generated from the White River National Forest GIS database.

**Road Density – Management Area 5.4 - located partially within Project Area**

The current road density for the 5.4 Management Area, located partially within the proposed project area, is 0.9 mile per square mile. This road density meets the Forest Plan Guideline of 2 miles per square mile.

Of 16.8 miles of road open to all vehicles and 6.4 miles of roads managed under special use permit, 0 miles are located within the analysis area. However, there is approximately 0.7 mile of road classified as decommissioned and approximately 0.2 mile of temporary road proposed for use located within the management area. The road density remains the same (0.9 mile per square mile) with the inclusion of these facilities in the road density calculation, still meeting the Forest Plan guideline of 2 miles per square mile.

**Road Density – Management Area 5.43 – Polygon (Habitat Area) 49**

There are no proposed units or haul/access points located within this management area. The current road density for the 5.43 Management Area – Polygon 49, located partially within the proposed project area, is 0.5 mile per square mile of road open to motorized travel between May 15 and June 20. This road density meets the Forest Plan guideline of 0.5 mile per square mile.

# Wildlife

## Resource Description

Federally threatened, endangered, and proposed species that could potentially be affected by activities of the project were retrieved from the U.S. Fish and Wildlife “Information for Planning and Conservation” (IPaC) website (https://ecos.fws.gov/ipac/). The Canada lynx (threatened) is the only species included in the IPaC Resources Report having the potential to occur in the project area. No portion of the analysis area has been designated as critical habitat by the Secretary of the Interior (PL-93-205, Section 4, 1978).

The current Rocky Mountain Regional Forester’s sensitive species list is dated July 28, 2016 (R2 Supplement FSM 2600, chapter 2670, supplement no. 2600-2016-1). All Species of Viability Concern on White River National Forest, as identified in the 2002 Forest Plan, are addressed as sensitive species.

Forest Service sensitive terrestrial species having potential to occur in the project area and be influenced by proposed activities are the western bumblebee, boreal owl, flammulated owl, northern goshawk, olive-sided flycatcher, purple martin, pygmy shrew, American marten, and hoary bat. The American elk is a species of concern under the Forest Plan and has potential to occur in the project area and be influenced by proposed activities.

### Canada lynx

In conjunction with mapping habitat, lynx analysis units (LAUs) have been identified following guidance provided by Ruediger et al. (2000) and are used as the primary analysis units for

assessing impacts to lynx habitat conditions. The project area overlaps the Divide Creek LAU. Lynx habitat data are presented in table .

**Table 10. Acres of Canada lynx habitat within the Divide Creek LAU**

| LAU No. | LAU Name | Total LAU Acres | Non-NFS | Total Habitat Acres | Primary Vegetation Acres | Secondary Vegetation Acres | Non-Habitat | Currently Unsuitable |
|---|---|---|---|---|---|---|---|---|
| 10 | Divide Creek | 113,491 | 9,601 | 83,700 | 45,831 | 36,785 | 20,132 | 1,084 |

Table  describes the current composition of lynx habitat within the LAU. Less than 1.5 percent of the LAU is currently unsuitable, based on White River National Forest mapping.

**Table 11. Composition of lynx habitat within the Divide Creek LAU**

| LAU No. | LAU Name | % of LAU comprised of Habitat | Primary Vegetation (acres) | % of habitat within LAU Currently Unsuitable |
|---|---|---|---|---|
| 10 | Divide Creek | 73.7 | 45,831 | 1.3 |

Approximately 93 percent of the lynx habitat within the project area (figure 13) is primary lynx vegetation (16,896 acres).

Cover types comprising this habitat are forested stands of aspen, spruce-fir, blue spruce, and mixed stands of aspen and these conifers. There are 1,281 acres of secondary lynx vegetation. Cover types in this habitat are Douglas-fir stands (34 percent of total), shrub and willow vegetation (28 percent of total), and grasslands.

Understory conifer cover for snowshoe hare is a critical component of Canada lynx habitat, and its conservation in project planning is important for maintaining lynx habitat across the Rocky Mountain Region (Southern Rockies Lynx Amendment, USDA Forest Service 2008). Understory conifer vegetation is variable in harvest units; some coppice aspen stands and some group selection spruce-fir stands have relatively high values of cover (units 103, 107, 108, 109, 209, and 210). In these units, horizontal conifer cover averages 35.1 percent (standard deviation=19.7 percent). The conifer component to the understory provides variable density, distribution, and height, which makes high-quality (aka winter) snowshoe hare habitat, by Southern Rockies Lynx Amendment definition.

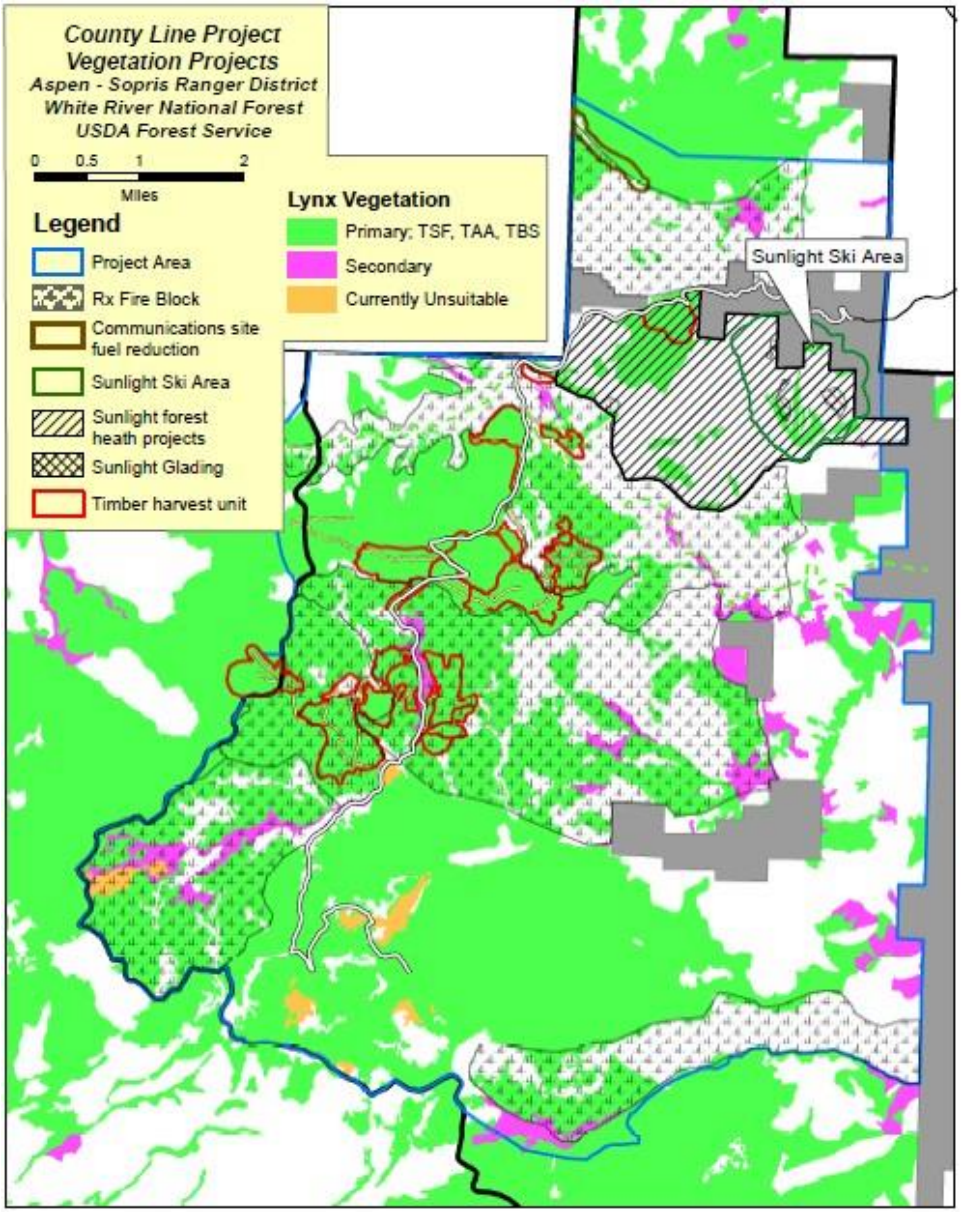


**Figure 13. Distribution of lynx habitat across the County Line project area**

## Forest Service Sensitive Terrestrial Species

The area from Fourmile Park south 9 miles to Quaker Mesa and from Spring Valley west 8 miles to Reservoir Park has a history of raptor and owl territories. This is documented in the Colorado Natural Heritage Program species occurrence data base as well as from past surveys done by Forest Service personnel, contractor surveys, and other efforts (primarily for gas exploration proposals within the past 15 years). The project area contains nesting and foraging habitat for the northern goshawk, which varies from marginal to suitable in aspen and spruce-fir stands. Forest nesting habitat is also present for common raptors, such as the red-tailed hawk. An inactive nest was found in unit 206 in 2016, with no additional nest activity observed. A partial nest was found in unit 105 in 2017, with no additional nest activity observed. Several sightings of raptors were

made during surveys, indicating presence of adults during nesting and brood-rearing periods, or juveniles present after fledging.

An olive-sided flycatcher territory and purple martins were located in and adjacent to unit 109. Crews noted finding possible nest cavities in aspens and aspen snags adjacent to water and openings, which is the type of nest site where purple martins are found.

Based on observations of American marten tracks, the species appears to be well distributed across conifer forest within the entire project area.

The presence of the hoary bat and western bumblebee is unknown in the project area, but based on assessment of vegetation, habitat for these species exists. The hoary bat is a seasonal resident from early summer to fall, whereas bumblebee queens will hibernate underground.

Three pygmy shrews were trapped at Middle Thompson Park and one near Baylor Park (Siemers 2009), along with other rodent species. Presence of moist environments adjacent to or within wet conifer forest above 9,600 feet elevation were the common components where pygmy shrews were found; this occurs elsewhere across the project area.

Elk are present in the entire project area, including Sunlight Ski Area, based on observations of individuals, signs of their occurrence, and from coordination with Colorado Parks and Wildlife. They are largely absent in winter due to deep snow covering forage and hindering movement. As snow recedes in spring, elk move in from the lower elevations west and east of the project area. Fall transition is also important and movement corridors with forest cover, water, and forage are needed to connect summer use areas to winter range. Transition range and movement corridors are present on the west, east, and southeast portions of the project area.

## Direct and Indirect Effects

Effects to evaluated species are disclosed in the project biological assessment for federally threatened, endangered, and proposed species and the biological evaluation for Forest Service sensitive terrestrial species and Forest Plan consistency analysis for American elk. These documents are included in the project record and are hereby incorporated by reference. The biological assessment for the Canada lynx received concurrence from the U.S. Fish and Wildlife Service on February 15, 2019. For the Canada lynx, effects of the proposal are considered at the LAU scale and in some cases within a smaller influence zone for individual projects. For Forest Service sensitive species and elk, effects of the proposal are considered at the landscape scale and within the influence zone for individual projects. Tree harvest of units greater than 40 acres are considered in effects analysis. For all evaluated species, potential direct and indirect effects are considered over the duration of the project activities, although some activities may influence effects to habitat over a much longer term as vegetation regenerates and grow. The scale of long-term effects is meaningful to about 120 years, unless future vegetation management occurs within this timeframe. The following actions are addressed, as they have potential to affect evaluated species:

a) Timber harvest and connected actions,

b) Sunlight Ski Area glading and forest health treatments,

c) Prescribed fire treatments,

d) Fuel reduction at Sunlight communications site,

e) Winter recreation improvements, and

f) Road gate relocation.

### Alternative 1 – No Action

Under this alternative, there would be no potential impacts to evaluated species from logging activity or prescribed fire in the form of disturbance or displacement or to species habitat in the form of fire, harvest, thinning, or felled trees and snags. There would be no potential impacts to existing habitat in the form of construction of temporary roads, skid trails, and landings. No unanticipated snow compaction would occur as a result of temporary road construction or creation of harvest openings. There would be no impacts to understory conifer vegetation that provides cover for lynx, snowshoe hare which are their primary prey, forage and cover for elk, sensitive species, and their prey. Conifer trees would remain that provide food and cover for squirrels, a secondary prey item for the lynx. At the LAU level, and across the landscape, habitat connectivity would remain in its existing condition and there would be no change in habitat suitability.

Over the long term, vegetation in the project area would be influenced by natural succession and disturbance processes. Conifer habitat that is presently poorly developed and lacks dense multistory characteristics would regenerate, but at a slow rate due to the decreased level of light penetrating the forest canopy; thereby suppressing understory regeneration. Two-story and multi-story conifer vegetation with well-developed understory and subcanopy layers would continue to provide existing capability for lynx and other species. Aspen habitat that is mature and lacking age class diversity would remain in an even-aged state until disturbance from disease or wind-throw opens gaps in the stand canopy. Poor-quality habitat conditions would persist as stands mature until natural processes introduce more gaps in the canopy, forest regeneration occurs, and dead trees provide complexity in the stand structure. These conditions could persist for more than 100 years without a natural disturbance event such as fire, wind-throw, or widespread insect infestation.

Vegetation at Sunlight communications site, which puts facilities at risk from fire, would be unchanged. Retaining existing conditions for lynx and other evaluated species would have no impact, except in the event of a fire at the site that carries into adjacent habitat. Impacts would vary depending on the scope and scale of fire effects to habitat present.

### Alternative 2 – Proposed Action

#### Canada lynx

The proposed action would convert 3,602.1 acres of primary lynx vegetation to 1,686.5 acres of secondary lynx vegetation and 1,915.6 acres of unsuitable habitat. Approximately 113 acres of high-quality (winter) snowshoe hare habitat would become temporarily unsuitable due to vegetation management and prescribed fire. Approximately 0.7 acre of primary lynx vegetation would be permanently lost for winter recreation improvements. However, the project activities would comply with Southern Rockies Lynx Amendment objectives, standards, and guidelines for vegetation management and other projects to minimize impacts to dense understory regeneration providing conifers for snowshoe hares. Connectivity to other habitat in the LAU would not be adversely affected and the project area is not in a landscape linkage. Therefore, the proposed action may affect but is not likely to adversely affect the Canada lynx.

Table 12 summarizes the potential effects that project activities would have to lynx habitat with the Divide Creek LAU.

**Table 12. Effects to lynx habitat in the Divide Creek LAU under the proposed action**

| Lynx Vegetation | Acres* | Change in Percentage of Lynx Habitat in LAU | Updated Percentage of all Lynx Habitat in LAU |
|---|---|---|---|
| Primary | -3,602.1 | -7.9% | 50.4% |
| Secondary | +1,686.5 | -4.5% | 41.9% |
| Unsuitable | +1,915.6 | +63.8% | 3.6% |

*a minus indicates a loss of acres, a + indicates an increase in acres

### *Timber Harvest and Connected Actions*

Table 13 discloses the potential impact that timber harvest and construction of temporary roads, skid trails, and landings would have to lynx. Timber harvest would convert approximately 113 acres of winter snowshoe hare habitat to unsuitable. Surrounding the harvested units, and to a degree within group selection units, lynx vegetation would remain for year-round foraging, security cover, and to facilitate landscape movements.

**Table 13. Anticipated effects to lynx habitat from timber harvest across 1,597 acres**

| Lynx Vegetation | Existing Acres | Suitability Unchanged | Suitability Secondary | Unsuitable |
|---|---|---|---|---|
| Primary | | | | |
| Aspen | 492 | 64 | | 428* |
| Spruce-fir (20% of 1,059 acres) | 1,059 | 847 | -- | 212** |
| Secondary | 0 | -- | -- | 0 |
| Non-habitat | 47 | 47 | -- | -- |
| Grand Total | -- | 47 | 0 | 704 |

*Comprised of 412 acres of aspen-conifer vegetation and 16 acres of high quality (winter) snowshoe hare habitat
**Approximately 97 acres are high quality (winter) snowshoe hare habitat

The potential for impact from clearcut patches greater than 40 acres is a secondary concern for the species since the vegetation to be coppice cut is low-quality habitat. What appears to be more important than patch size is the presence of snowshoe hare habitat, specifically forage available to snowshoe hares.

Construction of temporary roads in species habitat would be required to access some harvest units, resulting in a conversion of habitat to unsuitable conditions. Since all of these roads would be closed upon completion of the sale, this would only be a temporary conversion to unsuitable habitat. The change in vegetation would be minor across the analysis area.

For non-system roads that occur in species habitat, closures would incrementally benefit the species about 15 to 30 years after closure as vegetation regenerates and provides some additional prey habitat.

### Sunlight Ski Area Glading and Forest Health Treatments

The actions involving tree clearing and harvest could impact Canada lynx habitat. Gladed areas would become unsuitable habitat because these areas would be maintained open (table 14). Hazard tree felling for stand Type 1 and 3 would not have impacts to lynx because this would not be detectable to a lynx. Use of insecticides and pheromones and other proposed treatments would have no direct or indirect impacts to evaluated species. Forest health treatments involving harvest in stand Types 2 and 4 composed of spruce-fir and aspen have the potential to impact habitat for lynx. Approximately 20 percent of the area in stand Types 2 and 4 would be impacted, converting 97.4 acres of primary lynx vegetation to unsuitable.

**Table 14. Anticipated effects to Canada lynx habitat from Sunlight Ski Area glading and forest health treatments**

| Lynx Vegetation | Existing Acres | Suitability Unchanged | Suitability Secondary | Unsuitable |
|---|---|---|---|---|
| Primary | | | | |
| Aspen (20% of 257 acres) | 257 | 257 | -- | 51.4 |
| Spruce-fir (20% of 229 acres) | 229 | 183 | -- | 46 |
| Spruce-fir for Joslin glading | 5.5 | -- | -- | 5.5 |
| Secondary | 0 | -- | -- | 0 |
| Grand Total | 572 | 457 | 0 | 102.9 |

### Prescribed Fire Treatments

Although there would be potential for disturbance and temporary displacement of individuals from operations, these impacts are small and temporary with respect to the home range of a lynx and across the LAU. Under-burning would occur in aspen vegetation that provides primary habitat (Table 15). Based on the use of low to moderate intensity under-burning in aspen, there could be some incidental fire impacts to individual canopy trees, and there would be temporary loss of understory vegetation, including conifers comprising over 5 percent of the understory.

**Table 15. Anticipated effects to Canada lynx habitat from prescribed fire treatments**

| Lynx Vegetation | Existing Acres | % Area to be Consumed (+10%) | Suitability Unchanged | Suitability Secondary | Unsuitable |
|---|---|---|---|---|---|
| Primary | | | | | |
| Aspen | 3,373 | 50% | 1,686.5 | 1,686.5 | |
| Spruce-fir | 3,461 | 15% | 2,942 | -- | 519 |
| Secondary | | | | | |
| Grassland | 396 | 100% | | | 396 |
| Shrub | 164 | 70% | 49 | | 115 |
| Douglas-fir | 108 | 15% | 92 | | 16 |
| Grand Total | 7,502 | | 4,769.5 | 1,686.5 | 1,046 |

However, impacts to conifer stands that provide high-quality snowshoe hare habitat would be incidental from prescribed fire because this vegetation would be avoided during treatments.

Prescribed fire projects would primarily occur in spring, to use snow and moist ground conditions as holding features surrounding target vegetation, or fall when moist conditions limit fire consumption. During these scenarios, ground snow and moisture are common in conifer stands and somewhat present in aspen stands within the project area due to the elevation and topography. Fire effects are variable in aspen vegetation for this reason, and fire consumption of spruce-fir in these conditions would be incidental; occurring on the edge of conifer stands adjacent to target vegetation. Approximately 15 percent of primary lynx vegetation would be converted to unsuitable.

### *Fuel Reduction at Sunlight Communications Site*

Approximately 62 acres of primary lynx vegetation would be thinned; converting it to secondary lynx vegetation since some habitat attributes would remain. Direct and indirect impacts to species' habitat from clearing vegetation and woody debris would result in a reduction of prey cover and foraging habitat, if present.

### *Winter Recreation Improvements*

The proposed action would result in only a trace increase in the amount of non-habitat in the Divide Creek LAU, and would not be detectable to a lynx.

### *Road Gate Relocation*

There would be no direct and indirect impacts to lynx as a result of this proposed action. No connected actions are anticipated as a result of relocating the road gate.

### *Expanding NFS Road 300 Borrow Source*

Removal of approximately 3 acres of grassland, shrubs, and some forested vegetation would be an incremental increase in direct and indirect impacts to the species habitat.

## Forest Service Sensitive Terrestrial Species

The proposed action may adversely impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend to Federal listing or a loss of species viability range-wide for the western bumblebee, boreal owl, flammulated owl, northern goshawk, olive-sided flycatcher, purple martin, pygmy shrew, American marten, and hoary bat.

Some habitat would be protected by implementing appropriate design features. Trees that provide cover, refuge, and prey habitat immediately surrounding nest sites for evaluated bird species would remain, if identified, and protected through the life of the project. Some disturbances would be eliminated or minimized due to design features for restricting or delaying harvest and hauling operations during time periods that are critical for solitude, reproduction, and rearing young of evaluated species.

### *Timber Harvest and Connected Actions*

Table 16 discloses the potential impact that timber harvest and construction of temporary roads, skid trails, and landings would have to evaluated species. Potential habitat impacts involve the removal of canopy trees and understory vegetation, which provide thermal and security cover, dens and nest sites, perches, and prey habitat. For Forest Service sensitive species, proposed coppice cuts greater than 40 acres may impact individuals of the following species:

- Western bumblebee,
- Boreal owl,
- Flammulated owl,
- Northern goshawk,
- Olive-sided flycatcher,
- American marten, and
- Hoary bat.

Associated with the increased size of clearcut patches is an increase in temporary roads, skid trails, and landings, as well as additional log hauling. Impacts to individuals also include disturbance or displacement from established home ranges or seasonal habitats.

**Table 16. Potential impacts to evaluated sensitive species' habitat from timber harvest operations**

| Proposed Treatment Prescription | Vegetation | Acres | WB | BO | FL | NG | OF | PM | AM | HB | PS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coppice cut | Aspen (spruce-fir and meadow absent or a minor presence) | 185 | X | | X | X | | X | | X | |
| Coppice cut | Aspen, meadow, with some spruce-fir present | 538 | X | X | X | X | X | X | X | X | X |
| Group and individual tree selection (20% removal of 1,059 acres) | Spruce-fir with aspen | 212 | | X | X | X | X | X | X | X | X |

*Species Codes: WB=western bumble Bee, BO=boreal owl, FO=flammulated owl, NG=northern goshawk, OF=olive-sided flycatcher, PM-purple martin, AM=American marten, HB=hoary bat, PS=pygmy shrew

Coppice cutting aspen would impact 185 acres of habitat for all species except the boreal owl, olive-sided flycatcher, American marten, and pygmy shrew because these species are not found in aspen-dominated vegetation. In aspen stands with some conifer component, coppice cutting would impact up to 538 acres of habitat for all species. Group selection treatments across 212 acres would reduce the habitat quality of harvested stands in created groups and incidental vegetation damage from equipment travel to and from groups. Ground-based logging systems can crush and disturbed coarse woody debris that provides habitat for some evaluated species' prey (small mammals, insects, and invertebrates) and the pygmy shrew. Across group selection units of spruce-fir with aspen, approximately 847 acres would remain to provide forage for prey, cover, and reproductive sites, although the stands would be somewhat degraded until vegetation in openings created by harvest, skid trails, and landings regenerate to sapling and pole size.

In harvest areas, habitat suitability would increase once vegetation structure is more forest-like. The same is true for nesting and forest cover, except if the timeframe is perhaps 80 to 120 years. Across the landscape, habitat connectivity would remain, with some short-term modification of habitat capability for some species that currently occur in the project area.

### Sunlight Ski Area Glading and Forest Health Treatments

With the exception of activities taking place in grasslands, the actions involving tree clearing could impact sensitive species' habitat to some degree. Gladed areas would become marginal habitat to all sensitive species except for the western bumblebee because these areas would be maintained open (Table 17).

**Table 17. Potential impacts to evaluated sensitive species' habitat from Sunlight Ski Area glading and forest health treatments**

| Proposed Treatment Prescription | Vegetation | Acres | WB | BO | FL | NG | OF | PM | AM | HB | PS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Glading at Sunlight Ski Area | Spruce-fir, aspen | 47 | | X | X | X | X | X | X | X | X |
| Stand Type 1 Forest Health Treatments | Aspen, meadow, Spruce-fir, | 0-20/yr | | | | | X | | | X | X |
| Stand Type 2 Forest Health Treatments | Aspen (spruce-fir and meadow absent or a minor presence) | 5-40/yr | X | | X | X | | X | | X | |
| Stand Type 3 Forest Health Treatments | Spruce-fir, aspen | 0-20/yr | | | | | X | | | X | X |
| Stand Type 4 Forest Health Treatments | Spruce-fir, aspen | 5-40/yr | | X | X | X | X | X | X | X | X |

*Species Codes: WB=western bumble Bee, BO=boreal owl, FO=flammulated owl, NG=northern goshawk, OF=olive-sided flycatcher, PM-purple martin, AM=American marten, HB=hoary bat, PS=pygmy shrew

Hazard tree felling for stand Type 1 could impact the olive-sided flycatcher, hoary bat, and pygmy shrew. Individual hazard tree felling would have impacts only if occupied nest trees are felled. Forest health treatments involving tree felling and harvest in stand Type 2 composed predominantly of aspen may impact habitat for the western bumblebee, flammulated owl, northern goshawk, purple martin, and hoary bat. Forest health treatments involving tree felling and harvest in stand Type 3 and 4 composed of spruce-fir and aspen have the potential to impact habitat for all sensitive species except for the western bumblebee. Use of insecticides and pheromones and other proposed treatments would have no direct or indirect impacts to evaluated species.

### Prescribed Fire Treatments

Table 18 discloses the potential impact that prescribed fire, mechanical preparation of fire control features, and ground disturbance for construction of fire control line would have to evaluated species. Potential habitat impacts involve the removal of canopy trees and understory vegetation.

**Table 18. Potential impacts to evaluated sensitive species' habitat from prescribed fire treatments**

| Proposed Treatment Prescription | Vegetation | Acres | WB | BO | FL | NG | OF | PM | AM | HB | PS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prescribed Fire Treatments | Aspen, meadow, (spruce-fir absent or a minor presence) | 13,661 | X | | X | X | | X | | X | |

*Species Codes: WB=western bumble Bee, BO=boreal owl, FO=flammulated owl, NG=northern goshawk, OF=olive-sided flycatcher, PM-purple martin, AM=American marten, HB=hoary bat, PS=pygmy shrew

Western bumblebee ground nests, hibernating queens, and flowering plants could be crushed or burned as a result of the proposed action. For the flammulated owl, northern goshawk, purple martin, and hoary bat, potential habitat could be impacted as trees are felled or killed by fire in the short term until vegetation sprouting results in a mosaic of vegetation age classes that maintain foraging opportunities. Activities associated with fire ignition and mechanical preparation could temporarily displace individuals, but this would last only the duration of implementation for that block. Design features require that any nests found during pre-treatment surveys be protected according to Forest Plan standards. Also, timing of implementation in aspen should allow nesting pairs to raise young with minimal disruption. Given these measures, indirect and direct impacts should be insignificant for these species and should not have a detectable effect on species' fitness or ability to reproduce.

### *Fuel Reduction at Sunlight Communications Site*

All evaluated species have the potential to be impacted except for the western bumblebee (table 39). Direct and indirect impacts to species' habitat from clearing vegetation and woody debris would result in a long-term loss of concealment cover, prey cover, nesting structure, roost sites, dens sites, and foraging habitat, if present. Direct and indirect impacts to species are disturbance and displacement caused by human presence during clearing activities and potential mortality by clearing activities.

**Table 39. Potential impacts to evaluated species' habitat from fuels reduction treatments**

| Proposed Treatment Prescription | Vegetation | Acres | WB | BO | FL | NG | OF | PM | AM | HB | PS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuels Reduction at Sunlight Communication Site | Spruce-fir, aspen | To be determined | | X | X | X | X | X | X | X | X |

*Species Codes: WB=western bumble Bee, BO=boreal owl, FO=flammulated owl, NG=northern goshawk, OF=olive-sided flycatcher, PM-purple martin, AM=American marten, HB=hoary bat, PS=pygmy shrew

### *Expanding NFS Road 300 Borrow Source*

Removal of approximately 3 acres of grassland, shrubs, and some forested vegetation would be an incremental increase in direct and indirect impacts to evaluated species.

### *Winter Recreation Improvements and Road Gate Relocation*

Direct and indirect impacts from ground disturbance and vegetation clearing for the construction of the parking lot and winter route are similar to those of fuel reduction treatments at Sunlight

communications site. Areas would be permanently cleared of vegetation and human activity would somewhat increase, although the site is located along a road that receives regular use throughout the year. The proposal should not measurably increase the amount of human activity to the point that species' movements are disrupted or habitat connectivity is degraded.

There would be no direct and indirect impacts to evaluated species as a result of this proposed action. No connected actions are anticipated as a result of relocating the road gate.

## Elk

Although not a Forest Service sensitive species, elk are a species of concern under the Forest Plan (USDA Forest Service 2002) and impacts to elk are evaluated. Resting elk, cows attending young, and nursing young need long periods with little disturbance and vehicle traffic and human activity can be a disruption as much as 200 meters away (Rost and Bailey 1979). Because of the potential for vehicle and human disturbances and as a source of habitat fragmentation, open road density is an important component determining quality elk habitat. Low road density equates to low disturbance potential, less fragmentation of habitat, and less area where elk are displaced from otherwise effective habitat. By maintaining existing open road density in the project area, opening temporary roads as needed and closing them after project use, and limiting the type of travel and associated human presence on temporary roads, disturbance and displacement of elk from suitable habitat can be minimized.

Design features that restrict hauling and vegetation management operations, and use of prescribed fire during the peak calving period would help minimize disturbances to cows attending young and nursing young. Log hauling in the lower Fourmile Creek drainage would occur primarily when elk are in summer and fall habitat, not during calving.

Design features also ensure the project complies with Forest Plan guidance for managing elk and their habitat. Limiting nighttime harvest operations would help reduce potential disturbance and displacement and provide quiet for resting elk.

However, direct and indirect impacts to elk would occur, given the breadth, scope, and scale of projects proposed. This takes into account coppice cuts greater than 40 acres. Vegetation management glading, and prescribed fire would impact habitat values of security, cover, and forage as well as introduce some temporary fragmentation from use of temporary roads. Coppice cut units would be initially unsuitable to elk and attributes in group selection units, fuel reduction treatment areas, burned areas, gladed areas, and stands treated at Sunlight Ski Area would be reduced where tree groups are removed or burned and on skid trails, landings, and temporary roads, although some security, cover, and forage would remain surrounding these areas. Interiors of large clearcuts may be avoided initially, due to the lack of security cover. Over time, vegetation would return, providing forage (in the next growing season in many cases) and return of cover and security within 8 to 12 years following treatment of forested stands. Winter recreation improvements and expansion of the borrow source would contribute incrementally to these impacts through the small loss of elk foraging habitat for construction of project elements. Long term, vegetation management and areas burned using prescribed fire would provide improved summer foraging and elk calving habitat.

## Cumulative Effects

### All Species

The landscape and project area would continue to be used for a variety of public recreational uses, livestock grazing, and common uses on National Forest System lands. Impacts from these actions can have direct and indirect impacts to evaluated species and the scope and intensity of these activities in the project area would determine the level of impact. Since these actions are historic and ongoing, and the proposed action would not likely cause an increase in these activities, it is doubtful that these activities would contribute meaningful cumulative effects to those of the proposed action.

The Divide Creek LAU contains approximately 9,601 acres of private lands. Actions within private inholding are primarily related to maintaining cabins for summer use, maintaining livestock for personal use, and use during hunting seasons; which do not add to the potential impacts of the proposed action. Additional private lands within this LAU are found just east of the project analysis area along the White River National Forest boundary in a linear corridor on the eastern border of the LAU. Similar private land uses occur here, except that human activity occurs year-round. There are no State lands within the LAU. For the Canada lynx, where these activities fall within suitable habitats, they have the potential to affect the species either through habitat loss, habitat degradation, direct mortality, and/or behavioral impacts (e.g., displacement from habitats). On private lands, where the Federal Government's ability to regulate or mitigate impacts to lynx is diminished, the negative effect of such land uses on lynx may be more severe than those occurring from similar actions on Federal lands.

Urban expansion and development in Colorado and surrounding the Aspen-Sopris Ranger District has, in some cases, eliminated and fragmented habitat for elk and a variety of Forest Service sensitive species. The expansion of homes and some municipal facilities up mountain slopes in to forests of aspen and conifer habitat reduces forested habitat and increases fragmentation of habitat for species including the northern goshawk, flammulated owl, American marten, hoary bat, and purple martin. The cumulative effect of private land development has reduced and fragmented forest cover types for these species throughout White River National Forest.

## Forest Plan Consistency

The proposed action is consistent with the components of the White River Forest Plan.

The proposed action complies with Southern Rockies Lynx Amendment (2008) objectives, standards, and guidelines for vegetation management, human uses, ski area management, and recreation management.

Fuels reduction thinning at Sunlight communications site involves conifer vegetation and aspen-conifer stands. Where winter snowshoe hare habitat is present more than 200 feet from infrastructure, this vegetation would be retained. Thus, this standard would be met for fuels reduction thinning.

For harvest in multistoried spruce-fir stands, uneven-aged management is proposed to maintain and encourage gap dynamics. Harvest would occur in small groups limited to approximately 20 percent of each harvest unit's total size. Additionally, the project is designed to protect incidental damage to dense horizontal cover by retaining this vegetation during layout and by

implementing contract provisions during harvest. Damage would be limited to 20 to 30 percent of each harvest unit's total size.

Harvest units 209 and 210 are composed of spruce-fir and aspen vegetation with understory that provides winter snowshoe hare habitat. The silvicultural prescription for these units would retain areas of spruce-fir having dense understory regeneration. By implementing these measures, timber harvest is consistent with VEG S6.

The project is in compliance with Forest Plan objectives, standards, and guidelines for sensitive species and for American elk. This is presented in the project biological evaluation. Appropriate and adequate design features to meet Forest Plan objectives, standards, and guidelines for elk, Forest Service sensitive species, and species of viability concern have been incorporated into the proposed action.

## Climate

This section discloses the effects of the proposed action on greenhouse gas emissions.

The Council on Environmental Quality has withdrawn its Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (Federal Register/ Vol. 82, No. 64). This withdraw was effective April 5, 2017. The activities associated with the proposed action would contribute to CO2 emissions. When compared to the amount of emissions released at local or regional scales, emissions from the proposed action are expected to be of such small scale that they would have little bearing on climate change. In addition, the Forest Service does not have the ability to measure the amount of emissions released during the mining, transport, and refinement of traditional materials used for electricity, such as coal, natural gas, and hydroelectric projects. This type of analysis would be needed to compare the amount of emissions released from energy produced from biomass and then compare those emissions with those from traditional energy sources (coal, gas, hydroelectric plants).

Because local GHGs emissions mix readily into the global pool of GHGs, it is difficult and highly uncertain to ascertain the indirect effects of emissions from single or multiple projects of this size on global climate. Therefore, at the global and national scales, this proposed action's direct and indirect contribution to GHGs and climate change would be negligible. In addition, because the direct and indirect effects would be negligible, the proposed action's contribution to cumulative effects on global GHGs and climate change would also be negligible. Lastly, carbon emissions during the implementation of the proposed action would have only a momentary influence on atmospheric carbon concentrations, because carbon will be removed from the atmosphere with time as the forest regrows, further minimizing or mitigating any potential cumulative effects.

Forests have a "boom and bust" cycle with respect to carbon, as forests establish and grow, experience mortality with age or disturbances, and regrow over time. Forest management activities such as harvests and hazardous fuels reduction have characteristics similar to disturbances that reduce stand density and promote regrowth through thinning and removal, making stands and carbon stores more resilient to environmental change (McKinley et al. 2011). The relatively small quantity of carbon released to the atmosphere and the short-term nature of the effect of the proposed action on the forest ecosystem are justified, given the overall change in condition increases the resistance to wildfire, drought, insects and disease, or a combination of disturbance types that can reduce carbon storage and alter ecosystem functions (Millar et al. 2007, D'Amato et al. 2011). Furthermore, any initial carbon emissions from this proposed action will be

balanced and possibly eliminated as the stand recovers and regenerates, because the remaining trees and newly established trees typically have higher rates of growth and carbon storage (Hurteau and North 2009, Dwyer et al. 2010, McKinley et al. 2011).

In summary, this proposed action affects a relatively small amount of forest land and carbon on the White River National Forest and, in the near term, might contribute an extremely small quantity of GHG emissions relative to national and global emissions. Vegetation management activities proposed in the County Line project would not convert forest land to other non-forest uses, thus allowing any carbon initially emitted from the proposed action to have a temporary influence on atmospheric GHG concentrations, because carbon will be removed from the atmosphere over time as the forest regrows. This proposed action is consistent with internationally recognized climate change adaptation and mitigation practices.

## Roadless

The proposed project includes prescribed burning that would occur in designated Colorado Roadless Areas. Two Colorado Roadless Areas (CRA) would be affected by the proposed prescribed fire units, including East Divide/Four Mile Park and Thompson Creek. Approximately 1,108 acres (13%) of East Divide/Four Mile Park, and 3,445 acres (19%) of Thompson Creek Roadless areas would be affected by the proposed action. There are no upper tier acres proposed for treatment. Areas proposed to be treated with prescribed fire contain a variety of vegetation types including aspen, grass, and brush/shrub species. All fire treatments would follow prescribed burn plans developed for site-specific environmental and human resources. Before setting fires, crews would establish control lines as needed to manage its spread. Crews would construct fire lines by hand, and no heavy equipment would be used for line construction. Natural barriers, existing firebreaks, and wet lines may be used where appropriate. Existing roads, trails, and snow cover are often effective firebreaks. Prescribed fire units would be broadcast burned in spring or fall either by hand or using aerial ignition methods. Some minor tree cutting incidental to the above described prescribed fire activities may be necessary to safely accomplish the tasks. The incidental cutting supports maintaining and restoring normal ecosystem composition and structure through the use of prescribed fire. No linear construction zones would be created through this incidental cutting.

Roadless area characteristics were considered when determining the effects of the proposed action and project design features were added to minimize the effects to these characteristics.

1. High quality or undisturbed soil, water, and air. The effects of prescribed burning are to soil and water resources are described on pages 57-62 and 34-41, respectively. There may be a short effects to air quality due to burning operations, however these effects are expected to be of short duration. State requirements for emissions and air quality would be included in the burn plan.

2. Sources of public drinking water. Streams within the project area would be adequately buffered during prescribed fire activities. Streams within the project do not directly feed public drinking water, however some are tributaries to public water supplies.

3. Diversity of plant and animal communities. Prescribed fire treatments were designed to reduce the build-up of hazardous fuels as well as to improve wildlife foraging opportunities. Utilizing prescribed fire to increase vegetation structure and diversity

across the landscape would have a beneficial impact to the diversity of plant and animal communities.

4. Habitat for threatened, endangered, proposed, candidate, and sensitive species, and for those species dependent on large, undisturbed areas of land. The effects of prescribed fire to these species is documented on pages 67-79.

5. Primitive, semi-primitive no motorized classes of dispersed recreation. The effects of prescribed fire on these types of recreation are documented on pages 44-50.

6. Natural appearing landscapes with high scenic quality. The East Divide/Four Mile Park Colorado Roadless Area units have a Scenic Integrity Objective (SIO) of Low with small areas of Moderate in Forest Plan Management Area 4.3 – Dispersed Recreation. The Thompson Creek prescribed fire units have a Scenic Integrity Objective (SIO) of Low with one small area of Moderate located adjacent to private land. The effects of prescribed fire to scenic resources are documented on pages 50-57.

7. Traditional cultural properties and sacred sites. The effects of the project on cultural sites is documented on pages 33-34. In addition surveys would be conducted prior to any burning activities to ensure cultural sites are found. All properties eligible for the historic registrar would be adequately protected prior to initiating burning activities.

8. Other locally identified unique characteristics. There are no known locally identified unique characteristics in the affected Colorado Roadless Areas.

Roadless area characteristics are expected to remain much as they are now, following implementation of the proposed action.

# Agencies and Persons Consulted

The Forest Service consulted the following individuals, Federal, State, tribal, and local agencies during the development of this environmental assessment:

## Federal, State, and Local Agencies

City of Glenwood Springs

Pitkin County

Garfield County

Colorado Parks and Wildlife

U.S. Fish and Wildlife Service

## Tribes

Ute Mountain Ute Tribe of Colorado

Southern Ute Indian Tribe

Ute Indian Tribe of the Uintah and Ouray Reservation

## Others

Wilderness Workshop

Roaring Fork Conservancy

Black Hills Energy

Ski Sunlight

Permittees (Grazing Permittees)

New Multa Trina Ditch Company

Nieslanik Beef LLC

Hillside Rogue

Marjorie Perry and William Fales

Crystal River Ranch Co.

John Burtard

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# Appendix A – County Line Project Design Features

| Design Feature Number | Description |
|---|---|
| | **Recreation** |
| **#1** | Designate temporary alternative snowmobile routes around active units during winter operations. |
| **#2** | If winter plowing of Fourmile haul route occurs after November 15, the operator would be required to plow out the parking lot in Fourmile Park until the road closes on November 23. |
| **#3** | Snowmobile warning signs shall be posted at all plowed Road/Sunlight to Powderhorn system trail crossings. Signage shall include a warning to snowmobilers and non-motorized users that logging trucks are present, and additional signage for all logging trucks warning that snowmobiles and non-motorized users may be crossing the road. |
| **#4** | When plowing the road, plow operators shall feather the edges of each snowmobile trail crossing to prevent impassable vertical snow walls. |
| **#5** | Timing of logging activities in designated units should be rotated so as not to completely restrict snowmobile access along the main Sunlight to Powderhorn Trail route. |
| **#6** | Log hauling shall be restricted on weekends, holidays, and one day prior to the start of each big game rifle-hunting season. |
| **#7** | Loggers shall be prohibited from camping in dispersed sites along forest roads that are open to the public. |
| **#8** | The Forest Service shall work with affected outfitter/guides and other permittees to develop temporary operating plans that reduce the impacts of logging in the area of their operations. |
| **#9** | Notify the public when winter hauling is planned. Methods may include news releases, social media posts, public notices and the White River National Forest website. |
| | **Transportation** |
| **#1** | The soil and subgrade conditions that exist in the project area may not withstand heavy use during intermittent wet weather or extended periods of dry weather. To avoid permanent damage of the roadway and surrounding resources, haul will be restricted if signs of damage begin to occur. |
| **#2** | Ground-based operations, including felling, skidding and hauling will be suspended during periods of precipitation that result in excessive soil and/or road damage and may contribute to possible sediment discharges into stream channels. Hauling shall be suspended until the road sub-grade can adequately carry loaded log trucks and road damage will not occur. |

| Design Feature Number | Description |
|---|---|
| | **Transportation (continued)** |
| **#3** | Road maintenance, improvements, and reconstruction shall include adequate surface drainage and rolling dips (reinforced with geotextile and aggregate, if needed). Rolling dips shall not be installed on grades less than 2 percent or greater than 10 percent as determined by site conditions (Management Level 1 or 2 Roads). |
| **#4** | Reconstruction / Road Maintenance on unit access routes will be designed to provide long-term drainage and sediment control. |
| **#5** | Temporary or decommissioned roads to be rehabilitated shall use a combination of the following techniques including:<br>***** *Re-contouring the road prism to approximate the original topography for the sight distance from the entry point or 150 feet whichever is greater, as well as along steep slopes, areas adjacent to stream channels, and at stream crossings.*<br>***** *Rounding the backslope*<br>***** *Placing stumps, rocks, slash and logs on the ripped (12- to 18-inch depth) road. Density and depth to mimic the surrounding forest floor areas.*<br>***** *Push, pull, or deposit excavated soils and rock to fill in road cut.*<br>***** *Every 10 to 200 feet along the roadway beginning at junctions, fell or place live and/or dead trees across the roadway and suspend off of the cut bank where feasible.*<br>***** *Install waterbars, outsloping and cross drains as needed to stabilize the rehabilitated surface.*<br>***** *Seed compacted sites following ripping, using the seed mix described in the Botany Design Features.*<br>******Earthen or rock barriers (preferred) will be placed to block off the beginning of the road.* |
| **#6** | National Forest System roads and trails shall be posted with warning signs and traffic control devices shall be employed in accordance with the “Manual on Uniform Traffic Control Devices” (MUTCD) as needed. Signs will be required to warn users of increased truck traffic and logging activities and will be used to improve public safety during logging activities. |
| **#7** | Travel management signs and /or barricades designating road closures to motorized or mechanized travel will be placed as soon as possible to restrict traffic until permanent barriers can be placed. |
| **#8** | Work cooperatively with State, County, and local governments to inform and post road closure information. |
| **#9** | Work cooperatively with counties and commercial users to provide additional dust abatement that may be required during log hauling on NFS Road 300. |

| Design Feature Number | Description |
|---|---|
| | **Special Uses** |
| **#1** | Contact Black Hills/Rocky Mountain Natural Gas for line locates prior to timber sale operations in any natural gas pipeline or oil and gas operational area. Includes conducting road maintenance, moving equipment, construction temporary roads, skid trails landings, and any other logging operation. Work with the gas company to mitigate impacts if line is too shallow for crossing purposes. |
| **#2** | All commercial haulers shall enter into an agreement for performance of maintenance on NFS Road 300. If conflicts arise regarding responsibility for the maintenance, commercial hauling on these roads shall cease until the conflicts are resolved (TS Contract). |
| | **Soils** |
| **#1** | Avoid soil-disturbing actions during periods of heavy rain or wet soils. Operate heavy equipment within unit boundaries only when soil moisture is below the plastic limit, or protected by at least 1 foot of packed snow or 3 inches of frozen soil. Soil moisture exceeds the plastic limit if the soil can be rolled into 3mm threads without breaking or crumbling (WCPH Management Measure 6). |
| **#2** | Prior to implementation, the Forest Service must approve temporary roads, landings, skid trails and concentrated use-site locations to minimize potential damage to soils (ID Team). |
| **#3** | Avoid ground-skidding logs on “sustained” slopes steeper than 40 percent grades, as well as on moderate to severely unstable sustained slopes greater than 30 percent (WCPH Management Measure 9). |
| **#4** | Areas that are determined to have “highly” or “severely” unstable soils will be excluded from unit boundaries during layout (ID Team). |
| **#5** | Do not locate roads, landings, or skid trails on slopes that show signs of instability, such as slope failure, mass movement, or slumps (WCPH Management Measure 9). |
| **#6** | Manage land treatments to limit the sum of severely burned and detrimentally compacted, eroded, displaced land to no more than 15 percent of any activity area: Specifically:<br>***** *Designate the location and size of landing and major skid trails;*<br>***** *Minimize the length of temporary road approved to meet objectives;*<br>******To the extent practicable, limit the width of skid trails to 12 feet and ensure the spacing between skid trails is no closer than 120 feet on average;*<br>******Rip all landings and main skid trails to a depth of 8 to 12 inches and seed with Forest Service-approved seed mix immediately upon closure (WCPH Management Measure 13).* |
| **#7** | If machine piling of slash is done, conduct piling to leave topsoil in place and to avoid displacing soil into piles or windrows (WCPH Management Measure 14). |
| **#8** | Retain the average per-acre levels of coarse woody debris described in the Forest Plan in Table 2-1 Coarse Woody Debris Retention Levels by Forest Type (WCPH Management Measure 2, Forest Plan Soils Standard 7). |

| Design Feature Number | Description |
|---|---|
| | **Soils (continued)** |
| **#9** | Maintain the organic ground cover of each activity area so that pedestals, rills, and surface runoff from the activity area are not increased. The amount of organic ground cover needed will vary by different ecological types and should be commensurate with the potential of the site (WCPH Management Measure 2). |
| **#10** | Limit prescribed burns to slopes less than 55 percent to prevent soil erosion and loss of soil productivity. |
| | **Scenery – Vegetation Management** |
| **#1** | Openings in the canopy should have a natural appearance with uneven edges rather than straight lines where possible. The shape should be an irregular pattern like the existing natural openings and should avoid straight-line edges. The edges of the treatment units should be varied and random to soften and blend with the native vegetative mosaic. Favor existing healthy dominant trees such as aspen and woody shrubs to shape the edges of areas where materials are to be removed. Blend with natural landscape features such as natural meadows or openings and rock outcrops when possible. This will create free-form vegetative shapes that mimic natural patterns. Make clearing edges irregular and free-form, feathering and undulating edges where possible. Avoid geometric shapes. |
| **#2** | Unit boundary paint shall face away from open system roads and trails or be removed or 'blacked out' after the sale is complete. |
| **#3** | Root-wads created by the harvest activities that are visible in the foreground of an open system road shall be removed from sight. |
| **#4** | All stumps should be 12 inches or less. |
| **#5** | Slash and logging debris should be limbed and scattered over disturbed areas to a maximum depth of 18 inches of the ground surface within 100 feet of NFS Road 300 (Fourmile Road). After completion of pile burning, blackened logs and stumps should be scattered back into harvest units or removed to create scenic diversity. Leave some logs on the ground to provide wildlife habitat and scenic interest. Forest Plan guidance regarding coarse woody debris will be met. |
| **#6** | Where possible, place landings in existing openings, unless doing so would adversely affect other resources. If an existing opening cannot be used, clearing size and form of the landings should mimic that of surrounding vegetative mosaic as seen from middle ground and background views (distances greater than 0.5 mile). The shape of landings should be an irregular pattern like the existing natural openings and should avoid straight-line edges. |
| **#7** | When constructing temporary roads or any grading, excessive cut/fill slopes shall be avoided. Vary cut/fills to blend with the adjacent terrain, and leave in a roughened condition to facilitate revegetation. Stabilize fills and re-establish natural drainage configuration to the degree possible. |
| **#8** | All equipment and construction debris (human-made debris and trash, including old culverts) caused by timber operations shall be removed from site at sale completion. |

| Design Feature Number | Description |
|---|---|
| | **Scenery – Vegetation Management (continued)** |
| **#9** | Where feasible, construction of skid trails should avoid creating straight line corridors when the skid trails connect with open system roads and trails. Any skid trails should be rehabilitated to reduce the color contrast of the exposed soil by randomly scattering and spreading slash or replacing scraped material. Cover exposed bare soil with adjacent organic material. |
| **#10** | Do not leave unnatural-appearing rings of trees adjacent to openings. Any painted trees, which leave a strip along meadow edges, should be removed along with the other timber in the clearcut prior to the end of the sale. |
| **#11** | All disturbed areas shall be revegetated after the site has been satisfactorily prepared. Seeding should be repeated until satisfactory revegetation is accomplished. Reseed with a native seed mixture recommended by the Forest botanist. |
| **#12** | When leaving trees within treatment units, leave in clumps or groups and avoid leaving single 'whip' trees. Groups of 'leave trees' should occur at random distances and spacing for a more natural appearance (avoid regular spacing of trees). |
| **#13** | At the Sunlight communications site, limit chipped material to 3 inches or less. |
| | **Scenery – Borrow Source Expansion** |
| **#1** | Avoid visible straight lines created from tree cutting. Use a variable density cutting (feathering) technique applied to create a more natural edge that blends into the existing vegetation. Edges should be non-linear, and changes in tree heights along the edges of openings should be gradual rather than abrupt. Soften hard edges by selective removal of trees of different ages and heights to produce irregular edges where possible. |
| **#2** | Minimize the disturbance in existing vegetated areas that aren't part of the expansion area as much as possible during the construction and during operation. |
| **#3** | During layout of the proposed borrow source expansion, leave enough trees to ensure adequate screening from views on NFS Road 300. |
| **#4** | Use construction techniques that facilitate revegetation of cut and fill slopes (leave in roughened condition). Any cut and fill slopes shall be graded to conform the site to the adjacent terrain. Vary the pitch of cut and fill slopes. This involves slope rounding in both vertical and horizontal form as a more natural extension of landform surface configurations. |
| **#5** | When the borrow source is depleted and will not be used in the future, the shape of the reclamation for the borrow source should be designed and shaped to blend with existing topography. Design the recontouring in a scale that is characteristic of the surrounding landscape, borrowing directional emphasis of form and line from natural features. Blend soil disturbance into natural topography to achieve a natural appearance and reduce erosion. |

| Design Feature Number | Description |
|---|---|
| | **Scenery – Borrow Source Expansion (continued)** |
| **#6** | Strip and stockpile topsoil to use later to assist with revegetation of disturbed areas. Apply topsoil or fines after shaping and grading is completed. An organic fertilizer such as Biosol should then be applied per manufacturer's recommendation to facilitate planting and seeding success. |
| **#7** | All disturbed areas not being used as a borrow source shall be revegetated after the site has been satisfactorily prepared. Seeding should be repeated until satisfactory revegetation is accomplished. Reseed with a native seed mixture recommended by the Forest botanist. |
| | **Heritage** |
| **#1** | Cultural resource inventories (Class I literature search and Class III pedestrian survey) will be conducted before implementation in all areas within areas of potential effect (APE). The APE includes all areas within a proposed treatment unit and any access roads and/or staging areas outside of the treatment units. Areas that have been previously surveyed for cultural resources within the last 20 years and those inventories have been determined to be adequate by Forest heritage staff will not require new surveys. Areas with a greater than 30 percent slope will be excluded from full pedestrian survey, but could be reviewed as a Class II survey where areas of high potential could be visited if safe travel allows or might be viewed through the use of binoculars or Google Earth to determine if structural features might exist. In the event that the scope or design of the proposed project is altered or changed, additional review by the Forest's heritage staff will be required. |
| **#2** | Cultural sites located in previous surveys or during new survey efforts that may have traditional cultural and religious significance to Indian Tribes or other interested parties will require additional consultation with Colorado State Historic Preservation Office and the affected Indian Tribes or other interested parties. Consultation may include determination of eligibility and potential effects to sites, and/or mitigation to minimize or avoid effects. This can include traditional gathering areas for medicinal and foodstuff plants. |
| **#3** | 50-foot buffers will be established around all eligible and field-eligible historic property locations (cultural sites). Within these buffers, no ground-based mechanical activities will be allowed. This would include the use of tracked or rubber-tired vehicles and machinery. Hand treatments including the use of chainsaws is allowed within site buffers, but in these circumstances consultation with Forest heritage staff is required. No piling or dragging of forest materials (whole trees, logs, and/or branches) is allowed within site boundary buffers without Forest heritage staff approval. |
| **#4** | If any unrecorded cultural resources are discovered during this project, all project-related activities must cease immediately and the consultation process as outlined in Section 800.13 of the Advisory Council on Historic Preservation's regulations 36 CFR 800 must be initiated. |

| Design Feature Number | Description |
|---|---|
| **#5** | The Forest will document the results of the field inventory, consultation with Indian Tribes and any proposed measure to avoid adverse effects to historic properties. The report will be submitted to the State Historical Preservation Office (SHPO) and await comment prior to project implementation, usually a 30-day period. |
| | **Wildlife – Vegetation Management** |
| **#1** | Group openings will not exceed 20 percent of a given unit's total area. |
| **#2** | Plan regeneration harvests in lynx habitat where little or no habitat for snowshoe hares is currently available, to recruit a high density of conifers, hardwoods, and shrubs preferred by snowshoe hares. |
| **#3** | In clearcut units, exclude areas with relatively dense horizontal cover from unit boundaries. In group selection units, avoid placing group openings in areas that currently have an established understory with relatively dense horizontal cover. |
| **#4** | The contract will contain provisions for minimizing incidental disturbance to understory conifer vegetation. Trees should be directionally felled away from areas outside of clearcuts or group openings to minimize damage to advanced regeneration. |
| **#5** | Within the non-clearcut units, contract provisions will be used that call for skid trails, temporary roads and landings to be designated on the ground and approved by Forest Service personnel prior to harvest operations. These skidding and equipment travel restrictions will help retain and protect the understory conifer having the highest amounts of horizontal cover. |
| **#6** | Restrict off-road snowmobile travel in the project area to promote conifer regeneration by blocking temporary roads after annual harvest operations. Physical barriers, area closures, or other methods may be used to restrict over-snow travel until the time when conifer trees are no longer subject to physical damage from snow machines (approximately 5 feet above snow). |
| **#7** | Allow no nighttime operations except as authorized by the line officer in consultation with a Forest Service biologist. |
| **#8** | Broadcast burning could occur within any unit with a coppice prescription, within 1 year of harvesting activities, if this activity is included in a detailed prescription approved by a certified silviculturist, and not otherwise prohibited by design features (such as buffering threatened, endangered, or sensitive species, archaeological sites, etc.). |

| Design Feature Number | Description |
|---|---|
| **#9** | Protect active and inactive raptor and owl nesting sites discovered before or during project implementation. To protect active raptor and owl nesting sites, nest surveys will be done during the nest selection to fledging period prior to logging operations during the year of implementation. If a nesting site is found, the Timber Sale Contract should include the following protection measures: establish and maintain nest territories with adequate permanent habitat protection zone and seasonal activity restriction zones (no disturbance zones) around active breeding sites if possible to prevent the loss of those individuals.<br>***** *For goshawk nests, maintain a 30-acre area of uncut timber around the nest site (whether active or inactive) as a habitat protection zone.*<br>***** *For Cooper's hawks, a 20-acre area is needed.*<br>***** *For sharp-shinned hawks, a 10-acre area is needed.*<br>***** *For red-tailed, flammulated owl, and Swainson's hawks, a minimal buffer is needed to prevent blowdown of the nest tree.*<br>***** *The no disturbance zone is 1/3 mile surrounding active nests from March 15 ending August 1, or until fledglings have moved away from the nest site.*<br>***** *Any deviation of the polygon sizes and seasonal periods in this criterion would be done in coordination with a Forest Service wildlife biologist.*<br>***** *Do not locate temporary roads, skid trails, landings, construction staging areas, or new developments within habitat protection zones, unless approved by a line officer in coordination with a wildlife biologist.* |
| **#10** | Snags and trees used for purple martin nesting that are identified during pre-construction wildlife surveys will be retained, unless they pose a hazard. Establish and maintain these territories with adequate permanent habitat protection zone and seasonal activity use restrictions around breeding sites if possible to prevent the loss of those individuals. For the purple martin a 10-acre protection zone is needed. The no-disturbance zone is 1/4 mile surrounding active nests from March 15 and ending August 1, or until fledglings have moved away from the nest site. Any deviation of the polygon sizes and seasonal periods in this criterion would be done in coordination with a Forest Service wildlife biologist. Do not locate temporary roads, skid trails, landings, construction staging areas, or new developments within habitat protection zones, unless approved by a line officer in coordination with a wildlife biologist. |
| **#11** | Purchaser operations of falling, skidding, loading, hauling, road construction and road obliteration are restricted from May 15 to June 20 to reduce disturbances to elk calving, unless approved in writing by the Forest Service Representative/COR, following consultation with the District Ranger and wildlife biologist, on a case-by-case basis. Reasons for permitting activities during the calving period include site location, duration of activities, and unusual weather affecting localized elk use. |

| Design Feature Number | Description |
|---|---|
| | **Wildlife – Sunlight Ski Area Forest Health and Sunlight Communications Site** |
| **#1** | Conduct Sunlight Ski Area Forest Health projects from July 1 to December 1 and April 1 to May 15 to avoid the song bird nesting and young rearing period. Projects can proceed except if the presence of terrestrial wildlife or habitat triggers additional design features. |
| **#2** | Design features 3, 4, 5, and 11 for vegetation management activities may apply for group and individual tree selection treatments. |
| **#3** | Design fuels reduction treatments at the Sunlight communications site to retain pockets of winter snowshoe hare habitat in multi-story mature conifer stands that are more than 200 feet from infrastructure. Within 200 feet of sites, there are no restrictions on thinning dense conifer cover that provides winter snowshoe hare habitat. |
| | **Wildlife – Prescribed Fire** |
| **#1** | The line officer, in coordination with a Forest Service wildlife biologist will determine if pre-implementation surveys are needed for any endangered, threatened, candidate, proposed, or sensitive species listed in the future, for any treatments proposed. If these species are found, measures to protect or enhance individuals and their habitat will be incorporated into the treatment design. |
| **#2** | Protect raptor and cavity nests in the project area as necessary. If a nest site is found, include the following protection measures: establish and maintain nest territories with an adequate permanent habitat protection zone and seasonal activity restriction zones (no-disturbance zones) if possible to prevent the loss of those individuals. |
| **#3** | Protect purple martin nesting habitat in aspen vegetation and as necessary. |
| **#4** | Do not target sagebrush for burning and avoid crushing sagebrush with equipment. Design treatments to conserve sage and limit damage to no more than 25 percent of the sagebrush in the unit to maintain winter range and other values. |
| **#5** | Avoid treatments in any identified elk calving or mule deer fawning areas from May 15 to June 20 if it is likely to have adverse effects. Input from the Colorado Parks and Wildlife District Manager will be requested as necessary. |
| **#6** | Areas of lynx habitat in proposed burn units would be reviewed on the ground prior to implementation. Where field review indicates the presence of potential high-quality lynx habitat, any proposed burning would be designed to maintain the majority of the habitat while stimulating aspen regeneration adjacent to the stand edge. |
| **#7** | No spring burning should be conducted with 0.5 mile of any known or suspected occupied lynx denning area unless approved by a line officer in coordination with a Forest Service wildlife biologist. |

| Design Feature Number | Description |
|---|---|
| | **Invasive Plants** |
| **#1** | Invasive weed control, as outlined in the White River National Forest Invasive Plant Species Management Decision Notice/EA (2007) would take place as needed in the analysis area. Mitigation measures and contract provisions would be implemented to minimize spread of existing weeds and introduction of new ones. |
| **#2** | Preventive measures for invasive plants include:<br>***** *Integrating weed prevention and management into the project design.*<br>***** *Evaluating and treating weed populations before project implementation, re-evaluating weed populations after proposed mechanical and prescribed fire treatments are completed, and treating weeds after project implementation, as needed.*<br>***** *Evaluating revegetation needs for burn piles or other project areas on a case-by-case basis. Monitor these sites for noxious weed establishment, and treat weeds as necessary.* |
| **#3** | Prior to implementing each treatment unit, each unit would be surveyed for invasive plants. If any are discovered, potential design features for unit layout or implementation would be identified following the pre-implementation checklist. Applicable best management practices (FSM 2000 Zero Code 2080) for invasive/noxious weed management concerning roads, vegetation management, and prescribed burning are:<br><br>*Pre-treatment*. Assess risk of weeds in the environmental analysis.<br>***** *Incorporate weed prevention actions into aspen cutting, mechanical shrub cutting, and prescribed burning units, including road layout, design, and evaluation of alternatives. Weed infestations would be inventoried and scheduled for treatment.*<br>***** *Treat weeds on staging areas, roads, landings, foot trails, and skid trails that are weed-infested before activities are initiated, where practical to minimize risk of vehicular transport of weed seed from the project area.*<br><br>*During treatment*. For plant and aquatic invasive species, all mud, dirt, and plant parts would be cleaned from all off road equipment before moving into the project area. This would also be applied to equipment used for mechanical shrub cutting. Cleaning (and drying) would occur off National Forest System lands. This does not apply to service vehicles that would stay on the roadway, traveling frequently in and out of the project area (i.e., pickup trucks and log trucks). |
| **#4** | All mulch, hay and straw used shall be certified weed-free. Seed testing for noxious weed seed should be done as feasible, depending on the size of the project area, timing, and other considerations. |
| **#5** | Avoid prescribed fire where cheatgrass is present in proposed treatment units, unless approved by the line officer in coordination with a Forest Service invasive plant specialist and botanist. |

| Design Feature Number | Description |
|---|---|
| | **Botanical Resources** |
| **#1** | The line officer, in coordination with a Forest Service botanist, will determine if surveys for threatened, endangered, proposed and candidate; sensitive species; and/or species of local concern plant species are needed prior to implementing activities. If these species are found, measures to protect or enhance individuals and their habitat will be incorporated into the treatment design. |
| **#2** | Natural re-vegetation is preferred for sites with low erosion potential, suitable native seed sources nearby, and low risk of colonization by noxious weeds or other harmful invasive plant species. Where supplemental re-vegetation is desired, a Forest Service botanist would be consulted for species appropriate for the site conditions and goals. |
| **#3** | Avoid activities within 330 feet of fens. Should activity need to be conducted within 330 feet of a fen, Forest Service specialists (botanist, hydrologist, or soil scientist) would be consulted to ensure actions avoid impacts to the fen, soils, and water tables. |
| | **Hydrology** |
| **#1** | Retain live and dead trees within 100 feet of perennial and intermittent streams, except within designated stream crossings. |
| **#2** | Keep ground vehicles out of wetlands unless protected by at least 1 foot of packed snow or 2 inches of frozen soil. Do not disrupt water supply or drainage patterns into wetlands. |
| **#3** | Limit the amount of prescribed fire in any project area watershed to a maximum of 25 percent of the watershed area in any single year. |
| **#4** | Allow at least one growing season in between successive prescribed burns to allow vegetative and hydrologic recovery in the smaller watersheds of Park Creek, Yank Creek, and Beaver Creek |
| **#5** | Avoid using insecticides or pesticides that are applied using aerial sprayers within the water influence zone. |
| | **Fuels** |
| **#1** | Machine piles shall be located at least twice their diameter from standing green trees to minimize the potential for damage to residual timber. Machine piles shall be located in clearings to minimize damage to the canopy of residual trees during burning operations. Piles need to be constructed free of dirt to facilitate consumption during burning. Pile size shall comply with the latest direction from the Colorado Air Pollution Control Division. |
| **#2** | Residual fuel loading within treatment units should remain between 5 and 15 tons/acre. |
| **#3** | Lop and scatter slash to within 18 inches of the ground. Where fuel load is greater than 15 tons per acre, the excess slash would be burned or removed from the site. Burn piles with > 2” of snow pack to reduce residual damage to soils. |
| | **Vegetation** |
| **#1** | The Forest Service will conduct 1$^{st}$, 3$^{rd}$, and 5$^{th}$ year stocking surveys in all group selection openings and coppice clearcut units to monitor natural regeneration and assess the need for planting. |

| Design Feature Number | Description |
|---|---|
| **#2** | Artificial reforestation or fill-in planting may occur within group selection openings and/or coppice clearcut units if monitoring indicates in the 1st or 3rd year stocking survey that natural regeneration is not occurring or is not sufficient to meet Forest Plan standards (150 trees per acre lodgepole pine; 300 trees per acre aspen). |
| **#3** | The Forest Service will monitor for windthrow and noxious weeds while conducting 1st, 3rd, and 5th year stocking surveys. If windthrow or noxious weeds are observed, treatments will be developed based on the extent and species present. |
| | **Range** |
| **#1** | Protect range improvements such as cattle guards, stock tanks (ponds), and fences. Ensure that clauses in the harvest permit require the operator to repair any damage in a timely manner (before the improvements are needed for grazing operations, or immediately if during grazing season) and to the satisfaction of the USFS range specialist and grazing permitee. |
| **#2** | Any desired rest from grazing for revegetation shall be communicated to the range specialist at least 12 months in advance of the grazing season. Livestock rotation and schedule may be changed, but trailing activities through project areas may still be necessary. |
| **#3** | Quality on-going communication and coordination between timber sale specialists, USFS range specialist and grazing permit holders throughout the project timeframe to ensure potential safety hazards and issues are mitigated. |

# Appendix B – County Line Pre and Post Implementation Checklists

| **Prior-Year Implementation Checklist** | |
|---|---|
| **Resource Area** | **Action Item and signature/date** |
| ***General project design – Prescribed fire*** | |
| Target aspen while maintaining some vegetation in mature stages. Desired condition using fire is to underburn aspen stands to stimulate root sprouting in 30% or more of the treatment area. | |
| In subalpine parks, target subalpine grasslands dominated by native grasses. Keep fire out of adjacent conifer stands. Burn treatment units in a mosaic pattern over 2 to 3 seasons to provide areas of untreated dense older grasses in close proximity to more opened treated areas. If feasible, alternate treatments or otherwise design burns to increase "edge effect". | |
| Riparian areas, rivers and stream channels, isolated wetlands and wetland complexes, ponds, seeps, and springs would be protected by buffering these areas from equipment travel, mastication, and intense fire effects. No tree felling, piling slash, and pile burning would occur in these areas. Keep vehicles and equipment out of streams, lakes, and wetlands except to cross at designated points. Avoid construction of fire lines, and if required, minimize the amount of disturbed soil and restore fire lines when use ends. Do not conduct intense prescribed fire in the Water Influence Zone (100 ft on each side of perennial or intermittent streams); light burning is acceptable if organic matter is maintained. Unless approved by the Line Officer in coordination with a Forest Service hydrologist, aquatic/wildlife biologist, botanist, or soils scientist, extent of the buffer will be the Water Influence Zone. | |
| Following implementation, specialists (e.g., range, botanist/wildlife, soils, and/or fisheries) should assess treatments to determine if any revegetation is warranted. | |
| Ground disturbance activities may promote introduction and spread of weeds thereby reducing habitat capability. Pre and post-treatment weed spraying may be needed as determined by a weed specialist. These activities may take multiple seasons to accomplish. | |

| ***Terrestrial wildlife project design – Prescribed fire*** | |
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| The Line Officer, in coordination with a Forest Service wildlife biologist will determine if pre-implementation surveys are needed for any Endangered, Threatened, Candidate, Proposed, Sensitive, or Management Indicator Species listed in the future for any treatments proposed. If these species are found, measures to protect or enhance individuals and their habitat will be incorporated into the treatment design. | |
| Protect purple martin nesting habitat in aspen vegetation and as necessary. | |
| Protect raptor and cavity nests in the project area as necessary. If a nest site is found, include the following protection measures: establish and maintain nest territories with adequate permanent habitat protection zone and seasonal activity restriction zones (no disturbance zones) if possible to prevent the loss of those individuals. | |
| Protect Townsend's big-eared bat and fringed myotis hibernacula or maternity roosts, as needed, by restricting burning or tree felling within 0.25 miles of occupied or suspected roosts. Restrict actions within 500" of caves used by bats that would negatively affect use of such caves by bats. | |
| Do not target sagebrush for burning or mastication and avoid crushing sagebrush with equipment. Design treatments to conserve sage and limit damage to no more than 25% of the sagebrush in the unit in order to maintain winter range and other values. | |
| Avoid treatments in any identified elk calving or mule deer fawning areas during the period May 15-June 20 if it is likely to have adverse effects. Input from the Colorado Parks and Wildlife District Manager will be requested as necessary. | |
| For breeding migratory birds, avoid burning or mechanical treatments during the primary avian nesting and young rearing seasons:<br>• May 15 to end July.<br>Treatments may occur in these timeframes, with prior approval of the Line Officer in coordination with a Forest Service wildlife biologist. Reason for adjusting treatment periods may include changes in breeding and nest phenology due to annual variation in available summertime resources. Alternatively the biologist may design measures to protect or enhance individuals and their habitat, and these will be incorporated into the treatment design. | |
| Areas of lynx habitat in proposed burn units would be reviewed on the ground prior to implementation. Where field review indicates the presence of potential high quality lynx habitat, any proposed burning would be designed to maintain the majority of the habitat while stimulating aspen regeneration adjacent to the stand edge. | |
| No spring burning should be conducted within 0.5 miles of any known or suspected occupied lynx denning area unless approved by a Line Officer in coordination with a Forest Service wildlife biologist. | |

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| ***Fuels project design – Prescribed fire*** | |
| Where feasible and appropriate, utilize fire to accomplish resource management goals and objectives. | |
| All wildfire ignitions within the planning area would receive an appropriate management response according to the WRNF Fire Management Plan. | |
| Reduce the threat of wildfire to public and private developments in cooperation with partners to achieve manageable fuels levels. | |
| ***Silviculture project design – Prescribed fire*** | |
| Where prescribed fire is planned to address fuels in previously harvested spruce and fir stands, coordinate with the Silviculturist or Forester to ensure protection of planted trees and existing regeneration. | |
| Prepare detailed silvicultural prescriptions where prescribed fire is intended to regenerate aspen stands. | |
| ***Scenery project design – Prescribed fire*** | |
| Use natural breaks for fire lines whenever possible (rock outcrops, meadows and wet areas, changes in vegetation type/structure/condition etc.) Use concepts of a wave like line instead of straight lines and following natural patterns will help to retain natural landscape characteristics. Design and construction of fire lines should minimize vegetative disturbances and avoid straight lines. Constructed fire lines should be water barred and seeded. Hand lines should be from 1 to 3 feet wide. | |
| Desired scenic conditions include a diversity of shrublands and aspen/shrublands vegetative species including grasses, forbs, shrubs, and aspen. A variety in size, shape, and distribution intermingled within surrounding unburned areas is desirable in some areas; whereas in others, the creation of open spaces that provide scenic and physical access is preferred. Avoid piled or "windrowed" brush that would create scenic impacts for a long time. Post burn treatments should obliterate lines, address erosion concerns, and encourage vegetation re-growth. | |
| After the areas are burned, in the following year all disturbed areas without vegetation shall be revegetated after the site has been satisfactorily prepared. Seeding should be repeated until satisfactory revegetation is accomplished. Seed with a native seed mixture recommended by the Forest Botanist. | |
| ***Terrestrial wildlife project design – Pile burning*** | |
| Minimize pile burning in areas with noxious weeds present, including cheatgrass. | |

| ***Scenery project design – Pile burning*** | |
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| Where possible place landings in existing openings, unless doing so would adversely affect other resources. If an existing opening cannot be used, clearing size and form of the landings should mimic that of the surrounding vegetative mosaic as seen from middleground and background views (distances greater than ½ mile). The shape of landings should be an irregular pattern like the existing natural openings and should avoid straight-line edges. | |
| Lop and scatter slash to within 18 inches of the ground. Where fuel load is greater than 20 tons per acre, restrict hand piles to 10'x 10'x7' and conical in shape and landing piles to a maximum pile size of 45'x 20'x15' and conical in shape. Burn piles with ≥2" of snow pack to reduce residual damage to soils. | |
| After completion of pile burning, blackened logs and stumps should be scattered back into harvest units or removed. Leave some logs on the ground to provide wildlife habitat and scenic diversity. Forest Plan guidance regarding coarse woody debris shall be met. | |
| After the piles are burned, in the following year all disturbed areas without vegetation shall be revegetated after the site has been satisfactorily prepared. Seeding should be repeated until satisfactory revegetation is accomplished. Seed with a native seed mixture recommended by the Forest Botanist. | |
| ***Terrestrial wildlife project design – Sunlight Ski Area Forest Health*** | |
| Conduct Sunlight Ski Area Forest Health Projects from July 1 to December 1 and April 1 to May 15 in or der to avoid the song bird nesting and young rearing period. Projects can proceed except if the presence of terrestrial wildlife or habitat triggers additional design criteria. | |
| In clearcut units, exclude areas with relatively dense horizontal cover from unit boundaries. In group selection units, avoid placing group openings in areas that currently have an established understory with relatively dense horizontal cover. | |
| The contract will contain provisions for minimizing incidental disturbance to understory conifer vegetation. Trees should be directionally felled away from areas outside of clearcuts or group openings to minimize damage to advanced regeneration. | |
| Within the non-clearcut units, contract provisions will be used that call for skid trails, temporary roads and landings to be designated on the ground and approved by Forest Service personnel prior to harvest operations. These skidding and equipment travel restrictions will help retain and protect the understory conifer having the highest amounts of horizontal cover. | |

| ***Terrestrial wildlife project design – Sunlight Ski Area Forest Health (continued)*** | |
|---|---|
| Snags and trees used for purple martin nesting that are identified during pre-construction wildlife surveys will be retained, unless they pose a hazard. Establish and maintain these territories with adequate permanent habitat protection zone and seasonal activity use restrictions around breeding sites if possible to prevent the loss of those individuals. For the purple martin a 10-acre protection zone is needed. The no disturbance zone is 1/4 mile surrounding active nests from March 15 ending August 1, or until fledglings have moved away from the nest site. Any deviation of the polygon sizes and seasonal periods in this criterion would be done in coordination with a Forest Service Wildlife Biologist. Do not locate temporary roads, skid trails, landings, construction staging areas, or new developments within habitat protection zones, unless approve by a Line Officer in coordination with a Wildlife Biologist. | |
| Protect active and inactive raptor and owl nesting sites discovered before or during project implementation. To protect active raptor and owl nesting sites, nest surveys will be done during the nest selection to fledging period prior to logging operations during the year of implementation. If a nesting site is found, the Timber Sale Contract should include the following protection measures: establish and maintain nest territories with adequate permanent habitat protection zone and seasonal activity restriction zones (no disturbance zones) around active breeding sites if possible to prevent the loss of those individuals.<br>• For goshawk nests, maintain a 30-acre area of uncut timber around the nest site (whether active or inactive) as a habitat protection zone.<br>• For Cooper's hawks, a 20-acre area is needed.<br>• For sharp-shinned hawks, a 10-acre area is needed.<br>• For red-tailed, flammulated owl, and Swainson's hawks, a minimal buffer is needed to prevent blowdown of the nest tree.<br>• The no disturbance zone is 1/3 mile surrounding active nests from March 15 ending August 1, or until fledglings have moved away from the nest site.<br>• Any deviation of the polygon sizes and seasonal periods in this criterion would be done in coordination with a Forest Service Wildlife Biologist.<br>• Do not locate temporary roads, skid trails, landings, construction staging areas, or new developments within habitat protection zones, unless approved by a Line Officer in coordination with a Wildlife Biologist. | |

| ***Terrestrial wildlife project design – Sunlight Ski Area Forest Health (continued)*** | |
|---|---|
| Purchaser operations of falling, skidding, loading, hauling, road construction and road obliteration are restricted from May 15th to June 20th to reduce disturbances to elk calving, unless approved in writing by the Forest Service Representative/COR, following consultation with the District Ranger and wildlife biologist, on a case-by-case basis. Reasons for permitting activities during the calving period include site location, duration of activities, and unusual weather affecting localized elk use. | |
| ***Scenery project design – Sunlight Ski Area Forest Health*** | |
| The shape of new openings and ski runs in the forest canopy should appear natural and blend into the surrounding vegetated mosaic. Edges of new openings should be non-linear, and changes in tree heights along edges should be gradual rather than abrupt, where possible. Soften hard edges by selective removal of trees of different ages and heights to produce irregular corridor edges where possible. | |
| Unit boundary paint shall face away from ski runs and trails or be removed or 'blacked out' after treatment activities are completed. | |
| Stumps should be cut as low as possible to the ground to lessen scenery impact and avoid safety hazards. | |
| All disturbed areas shall be revegetated after the site has been satisfactorily prepared. Seeding should be repeated until satisfactory revegetation is accomplished. Seed with a native seed mixture recommended by the Forest Botanist. | |
| Vegetation should be retained where possible to screen facilities from key viewpoints. | |
| Rootwads created by the harvest activities that are visible in the foreground of an open system road or trail shall be buried or otherwise removed from sight. | |
| ***Silviculture project design – Sunlight Ski Area Forest Health*** | |
| Prepare detailed silvicultural prescriptions for all forested vegetation treatments | |
| Design forest health projects that seek to create a new age class in a manner where regenerating trees are protected from damage caused by skier use. Natural features, topography, and skier use patterns may be considered during project design and may be used to protect regenerating trees. Areas may also be "roped off" if necessary. | |
| ***Scenery project design – Communications site*** | |
| Avoid visible straight lines created from tree cutting. Use a variable density cutting (feathering) technique applied to create a more natural edge that blends into the existing vegetative. Edges should be non-linear, and changes in tree heights along the edges of openings should be gradual rather than abrupt. Soften hard edges by selective removal of trees of different ages and heights to produce irregular edges where possible. | |

| ***Scenery project design – Communications site (continued)*** | |
|---|---|
| Slash would be treated to avoid dense mats that would prohibit regeneration. Slash may be treated through removal, lop and scatter up to 18-inch depth, piling and burning. Cut trees and shrubs and branches greater than four (4) inches in diameter must be removed by hauling, chipping, piling and burning or by other means. Slash less than four (4) inches in diameter must be removed or lopped and scattered to ensure woody material is discontinuous (less than 60% of surface covered by chunks or limbs) with a maximum depth of 18 inches and the total slash present on site should not exceed 15 tons per acre. Large slash piles must be removed or burned to reduce the hazard of fire and for aesthetic reasons. | |
| All stumps should be 12” or less. | |
| Unit boundary paint shall face away from open system roads and trails or be removed or ‘blacked out’ after the sale is complete. | |
| Rootwads created by the harvest activities that are visible in the foreground of the road shall be removed from sight. Rootwads should not be used to close roads and landings which are within 50’ of roads. | |
| All disturbed areas shall be revegetated after the site has been satisfactorily prepared. Seeding should be repeated until satisfactory revegetation is accomplished. Reseed with a native seed mixture recommended by the Forest Botanist. | |
| Vegetation should be retained where possible to screen communication site facilities from key viewpoints. | |

| **Post Implementation Checklist** | |
|---|---|
| **Resource Area** | **Action Item and signature/date** |
| ***Terrestrial wildlife project monitoring – Prescribed fire*** | |
| A combination of photo-point monitoring and plot sampling will be used to determine if treatment objectives are met. Monitoring indicators are:<br>• Aspen- Regeneration meeting Forest Plan objectives, measured following Forest Plan monitoring protocols or equivalent<br>• Grasslands- Treatments effectively 1) reduce litter density; 2) increase quantity of available forage, 3) maintains species composition, 4) no measurable difference in noxious weed presence. Note: objectives to be monitored at transects, Daubinmeyer grids, or other appropriate means | |
| Big game - objectives to be monitored at transects, fixed-radius plots, or equivalent: 1) increased age diversity of plants; 2) increase quantity of available browse and palatable forage (live stems that deer, or elk could browse). | |
| ***Fuels project monitoring – Prescribed fire*** | |
| Fuels management specialists will conduct periodic ocular assessments of fuel bed condition over a five year period following the completion of planned prescribed fir and Wildland Urban Interface treatments. These assessments should utilize the General Technical Report by Scott and Burgan, RMRS-GTR-153 Standard Fire Behavior Models. | |
| Fuels specialist would assess the value of using multiple prescribed fire entries, as needed, to achieve fuels management objectives. | |