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Mitchell Spring Vegetation Improvement Project

Final Environmental Assessment



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SUMMARY

The Dixie National Forest proposes to implement various vegetation actions including regeneration harvests, thinning, reforestation, wildland urban interface fuel breaks, and prescribed fire. The proposal also includes changes to the Motorized Travel Plan. The project area is within the Escalante Ranger District in Garfield County, Utah, approximately 13 miles northwest of the City of Escalante and located within T34S R1W Sections 13, 14, 22, 23, 24, 25, 26, & 27, T34S R1E Sections 17, 18, 19, 20, 30, 31, 32, & 33, and T35S R1E Sections 4 & 5 of the Salt Lake Base and Meridian. The purpose for this project is to: (1) establish and maintain desired conditions for vegetation within the Mitchell Spring project area to improve forage and habitat for wildlife; (2) reduce wildfire intensity and create defensible space around the wildland urban interface (WUI), and protect forest resources from unwanted fire; and (3) provide access to the Mitchell Spring area for appropriate public and administrative purposes.

The Forest Service evaluated the following alternatives:

- *Alternative 1 - No Action.* Under this alternative, no action would be taken other than normal, ongoing management activities that would occur without a decision on this project.
- *Alternative 2 - The Modified Proposed Action.* The Modified Proposed Action includes the following six components: (1) pinyon-juniper control; (2) ponderosa and mixed conifer group selection; (3) artificial reforestation with site preparation by prescribed fire; (4) ponderosa pine stand improvement; (5) wildland urban interface treatments; and (6) update to the Forest transportation plan. These actions are described in Chapter 2.
- *Alternative 3.* This alternative incorporates many of the actions proposed in the Modified Proposed Action alternative. Differences include: (1) no vegetation treatments occur in areas identified in Forest inventories as unroaded/undeveloped, particularly those in ponderosa pine stand improvement, Action 5, that occur south of FSR 30151; (2) no new temporary roads are constructed to facilitate vegetation treatments; (3) vegetation treatments are limited or prescriptions differ within designated northern goshawk Nest Areas (NA), and Post-fledgling Family Areas (PFA); (4) reforestation occurs without prescribed fire and/or mowing; microsite preparation would be done in the same manner as the current Modified Proposed Action; and (5) FSR 30151 is closed after treatments are completed, former FSR 30538 remains closed classified, and former FSR 30150 is designated for administrative use only. These actions are described in Chapter 2.

Based on an evaluation of the effects of the alternatives, the responsible official will decide whether to implement Alternative 2 (Modified Proposed Action), Alternative 3, a combination of the Modified Proposed Action and Alternative 3, or to take No Action.

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

DOCUMENT STRUCTURE

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the Modified Proposed Action and alternatives. The document is organized into four parts:

- *Purpose and Need for Action:* This chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This chapter also details how the Forest Service informed the public of the proposal and how the public responded.
- *Alternatives including the Proposed Action:* This chapter provides a more detailed description of the agency's Modified Proposed Action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on key issues raised by the public and other agencies. This discussion also includes project design features. Finally, this chapter provides a summary table of the environmental consequences associated with each alternative.
- *Affected Environment and Environmental Consequences:* This chapter describes the environmental effects of implementing the Modified Proposed Action and other alternatives. This analysis is organized by resource area. Within each resource area the affected environment is described. Following this, there is a description of the effects of taking No Action. This provides a baseline for evaluation and comparison of the other alternatives. Finally, the effects of implementing each of the action alternatives are described.
- *Consultation and Coordination:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Escalante Ranger District Office in Escalante, Utah; or on the Dixie National Forest's project website: <http://www.fs.usda.gov/project/?project=40232>.

BACKGROUND

Project Location

The Mitchell Spring project area is located within Garfield County, Utah, approximately 13 miles northwest of the City of Escalante and located within T34S R1W Sections 13, 14, 22, 23, 24, 25, 26, & 27, T34S R1E Sections 17, 18, 19, 20, 30, 31, 32, & 33, and T35S R1E Sections 4 & 5 of the Salt Lake Base and Meridian (see Vicinity Map, Figure 4). The access to the project area is Forest Highway 17 (FH-17, Main Canyon Road) off of Utah State Route Highway 12 (SR-12), approximately 4 miles west of Escalante. Main Canyon Road can also be accessed from the west, via Johns Valley Road (CR-1660) and Escalante Canyon Road (FH-17), which leaves Johns Valley Road in Widtsoe, Utah. The southern-most portion of the project area abuts private land along Main Canyon Road. The project area is located mostly within the Birch Creek subwatershed, although a small portion is within the North Creek subwatershed. There are no designated wilderness areas or inventoried roadless areas (IRA) within the project area. The Jake Hollow IRA is adjacent to the eastern project area boundary (see Vicinity Map, Figure 4).

Resource Character

The project area encompasses the upper reaches of the Birch Creek watershed. Elevation varies from 6,920 feet at the lowest point along Birch Creek to 9,360 feet near the junction of Forest Highway (FH) 17 and Forest System Road (FSR) 140 (Griffin Top Road). At lower elevations the vegetation is a sagebrush shrubland. As elevations rise from the valley bottom the vegetation transitions first to pinyon pine-juniper woodlands, then to ponderosa pine, and finally, along the upper slopes, to mixed conifer and spruce-fir forests (see Vegetation Cover Types, Figure 5 and Table 1).

Table 1. Project area vegetation cover types and acres.

Vegetation Cover Type	Acres
Ponderosa Pine	2,782
Pinyon-Juniper	1,144
Mixed Conifer Forest	196
Cottonwood-Willow	50
Spruce-Fir	39
Rock-Badlands	35
Meadow	33
Oak	27
Aspen	7
Total	4,313

Relationship to the Forest Plan

The Dixie National Forest (DNF) Land and Resource Management Plan (Forest Plan) defines specific goals and objectives by management area. The management areas (MA) within the Mitchell Spring project area include MA 1 (General Direction), MA 2B (Roaded Natural Recreation), MA 6 (Livestock Grazing), MA 7 (Wood Production and Utilization) and MA 9A (Riparian Management) (see Management Areas, Figure 6 and Table 2).

Table 2. Management area and acres within the Mitchell Spring project area.

Management Area Description	Management Area Code	Acres
General Direction	1	538
Roaded Natural Recreation	2B	2,373
Livestock Grazing	6A	418
Wood Production and Utilization	7A	954
Riparian Management	9A	30
Total		4,313

Following is a description of the desired future conditions for each of the management areas found within the Mitchell Spring project area, as excerpted from the Forest Plan.

General Direction (1) (applies to all management areas)

Desired Future Condition: A combination of silvicultural harvest methods that maximize present net value will be used in conjunction with meeting multiple use objectives and associated constraints on timber management. Intensive practices such as pre-commercial thinning will be used in all timber working groups except aspen. Future silvicultural condition of timber stands will be improved over current conditions (USDA 1986: IV-21).

A safe, functional, and environmentally sound transportation system will be developed. Road construction will be coordinated with other resource activities. The basic arterial collector system will be constructed or reconstructed to meet the Road Management Plan (USDA 1986: IV-23).

Roaded Natural Recreation (2B)

Desired Future Condition: This area is characterized by a modified natural environment. Resource modification and utilization practices usually harmonize with the natural environment. In some of the modified zones within this area, utilization practices enhance recreation activities, maintain vegetative cover, and soil (USDA 1986: IV-68).

Livestock Grazing (6A)

Desired Future Condition: Acreage of areas receiving this emphasis will remain essentially the same as presently. Production and range condition will be improved. Areas where vegetation manipulation practices have been accomplished will be maintained for optimum forage production (USDA 1986: IV-109).

Wood Production and Utilization (7A)

Desired Future Condition: This management area contains most of the commercial timber on the forest and is the most highly productive for growing timber. The basic long-range objectives of timber management for this area are:

1. Create and maintain nearly equal areas in seedlings and saplings, pole timber, immature saw timber and mature saw timber.

2. Create and maintain stand conditions that will minimize growth loss and mortality from insects and diseases.
3. Convert slow growing stands of mature saw timber (beyond culmination of mean annual increment for the product size objective) to young, thrifty stands of desirable species (USDA 1986: IV-114).

Riparian Management (9A)

Desired Future Condition: Riparian ecosystem remains healthy and viable. Sufficient habitat remains to support at least minimum viable populations of riparian dependent wildlife species. Water quality is not impaired below existing levels and is improved in some areas. Stream channel stability is maintained or, in areas where it is severely degraded, is improved to at least minimally acceptable standards. Area provides multiple resource outputs while providing protection to riparian dependent values(USDA 1986: IV-135).

Utah Fire Amendment (Applies to all management areas)

Desired Future Condition: Ecosystems are restored and maintained, consistent with land uses and historic fire regimes, through wildland fire and prescribed fire (USDA 2000d: A-35, 36).

Utah Northern Goshawk Amendment (Applies to all management areas)

Desired Future Condition: Goal No. 17A -Restore or maintain forested landscapes in a properly functioning condition (PFC). Functioning forested landscapes provide habitat for the northern goshawk (hereafter, “goshawk”) and its prey to support a viable population of goshawks in Utah (USDA 2000e: CC-18).

All management indicator species (MIS) habitat will be maintained at levels that meet or exceed requirements for minimum viable populations(USDA 1986: IV-21).

Special Area Designations

Inventoried Roadless Areas

Inventoried Roadless Areas are those areas identified in a set of inventoried roadless area maps contained in the Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, and any subsequent update or revision of those maps through the land management planning process (36 CFR 294.11).

The Mitchell Spring project area is adjacent to the Jake Hollow Inventoried Roadless Area (see Vicinity Map, Figure 4).

Unroaded/Undeveloped Areas

Beginning in 2000 and continuing through 2006, the Dixie and Fishlake National Forests conducted a joint effort to revise their Forest Plans. Part of this revision included consideration of areas for wilderness potential, which was conducted to the direction in the *Intermountain*

Region Planning Desk Guide: A Protocol for Identifying and Evaluating Areas for Potential Wilderness (USDA 2004b). This inventory only considered known classified system roads (with the exception of administrative use only roads) and thus identified areas as unroaded/undeveloped that currently contain numerous constructed roads and trails, as well as timbered areas, power lines and other infrastructure. The inventory findings did not undergo a formal NEPA public review. A new inventory and reevaluation using current road inventory, timbered areas, and infrastructure data will be necessary to fully understand the character of these areas.

There is no policy, law, or directive guiding the management of unroaded/undeveloped areas that lie outside of IRAs or wilderness. Currently, the only guidance for these areas is general forest or management area direction. It is the intent of the Dixie National Forest to manage these unroaded/undeveloped areas for multiple resource benefits while maintaining their undeveloped character to the extent possible (see 2005 Planning Unroaded/Undeveloped Areas, Figure 4).

Existing and Desired Conditions

The proposed project's purpose and need derive from an analysis of existing and desired conditions aimed at determining the gap between these conditions and the actions that might be implemented to close or narrow this gap. The existing condition is the current status of the resource, while the desired condition is the condition that we wish to achieve. The gap is the difference between existing and desired conditions, and the Modified Proposed Action defines how the gap is to be closed.

This section provides a description of existing and desired conditions within the project area. The descriptions of the existing and desired condition for the vegetation resources are organized under the four criteria determined to be part of a properly functioning condition (PFC) (Amundson 1996; USDA 2000c, 2006). The four ecosystem characteristics discussed and compared throughout the analysis are vegetative structure, composition, disturbance regime, and patterns. PFC operates within the range of a natural range of variation (NRV) where extreme events are not desired. An ecosystem that is properly functioning is thought to be resilient to disturbances in structure, composition, and biological or physical processes (Forest Service Manual [FSM] 2020.5). Ecosystems at risk are those that may be degraded beyond the range of resiliency and sustainability. The ecosystem characteristics serve as the measure to compare the existing condition to the desired future conditions defined by the Forest Plan.

Shrublands

Shrublands within the project area are located within MA 2B and 7A. Shrublands are areas where the predominant vegetation includes shrubs, forbs and grasses. Typically shrublands are in valley and drainage bottoms adjacent to woodland and forest-covered slopes. The shrublands complex is a mosaic of mountain big sagebrush (*Artemisia tridentata*), low sagebrush (*Artemisia arbuscula*), black sagebrush (*Artemisia nova*) and herbaceous plant communities. Co-dominant shrubs may include antelope bitterbrush (*Purshia tridentata*) and rabbitbrush (*Chrysothamnus* spp.). Dominant grasses include introduced crested wheatgrass (*Agropyron cristatum*), and natives such as Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Agropyron spicatum*), needlegrasses (*Stipa* spp.) and bluegrasses (*Poa* spp.). Currently 30 acres of natural meadows

within forest stands are being encroached by conifers. Table 3 summarizes existing and desired conditions for shrublands.

Table 3. Existing and desired condition for shrublands.*

Existing Condition of Shrublands	Desired Condition of Shrublands
Structure of most shrublands within project area are trending toward or meeting PFC. Within some areas, conifer trees are encroaching into shrublands.	Structure- Balanced range of structural stages (shrub canopy cover). Bare soil should average less than 20 percent and signs of accelerated erosion should be absent.
Composition of most shrublands within project area are trending toward or meeting PFC. Conifers are increasing in composition within some areas.	Composition- Native, late-seral species should dominate the herbaceous layer with exception for crested wheatgrass seedlings. Invasive plants should be less than 10 percent of relative frequency.
Processes- Fire has been excluded from shrublands in project area.	Processes- Lethal fire regime on an approximately 20 to 40 year return interval
Patterns- With fire exclusion conifer tree densities exceed 10 conifer trees per acre and are increasing on about 30 acres of shrubland.	Patterns- Conifers should be absent or limited by periodic fire to a few scattered seedlings. Vegetation patterns are usually patchy with several age classes represented in a given area

*Referenced from (Hood and Miller 2007; Stebleton and Bunting 2009; USDA 2000c, 2006, 2009a).

Woodlands

Romme and colleagues defined three general kinds of pinyon-juniper vegetation: woodlands, savannas, and wooded shrublands. These pinyon-juniper types are based on canopy structure, understory characteristics and historical disturbance regimes (Romme 2009).

The pinyon-juniper within the project area is mostly pinyon-juniper woodlands. Most woodlands within the project area fall within MA 1, though patches are located within 2B, 6A and 7A. These woodlands consist of Rocky Mountain juniper (*Juniperus scopulorum*), Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus edulis*). Associated shrubs include mountain mahogany (*Cercocarpus ledifolius*) and cliffrose (*Purshia stansburiana*). On more mesic sites, ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), subalpine fir (*Abies lasiocarpus*), aspen (*Populus tremuloides*) and Engelmann spruce (*Picea engelmanni*) may be present.

Most project area woodland areas are currently at the desired condition and are not identified for treatment. Table 4 summarizes existing and desired conditions for woodlands.

Table 4. Existing and desired conditions for woodlands.*

Existing Condition of Woodlands	Desired Condition of Woodlands
Structure- The woodlands in the project area are considered persistent woodlands located on steep topography and south facing slopes. Tree densities are currently stable and are not identified for treatment. Stand age on average exceeds 150 years of age. Canopy cover increasing on some sites with ingrowth of juniper seedlings and saplings. Canopy cover averages 29 percent.	Structure- On sites where the oldest trees are less than 150 years of age, pinyon-juniper canopy cover should not exceed 10 percent to maintain the grass, forbs and shrub community. In areas where the oldest trees exceed 150 years of age and canopy cover may be higher than 10 percent and such sites are lower priorities for treatment.
Composition- Most woodlands in project area are located on steep rock faces with large expanse of slick rock and boulders. Shrub, forb, and grass canopy cover is less than 20 percent. Bare ground ranges from 20 to 40 percent.	Composition- With pinyon-juniper woodlands, shrub, forb and grass composition make up 20 percent or more of total vegetation as defined by canopy cover. Bare ground is less than 30 percent of the soil surface.
Processes- Site visits and aerial surveys indicate endemic insects and disease populations within project woodlands. Insect caused mortality is mostly single tree and intermittent throughout the project area. The persistent woodlands within the project area have an infrequent fire history that is currently is considered within the historic range of variability.	Processes- With pinyon-juniper woodlands, endemic insect and disease populations are desired. Fires on average burn every 35-200+ years to prevent pinyon and juniper stands from spreading into neighboring grasslands and shrublands.
Patterns- Tree densities are currently stable within the persistent woodland component and are currently at the desired condition. Within transitional areas, pinyon-juniper populations are increasing. More information and possible treatment activities are captured within the forest assessment below.	Patterns- Within persistent woodland pinyon-juniper sites, tree densities are stable and persist in relatively “fire safe” sites based on topography. Some pinyon-juniper dominated sites would have been considered transitional; historically subject to periods of pinyon-juniper dominance and then stand replacing fires remove the pinyon-juniper for many years until seed from the fire safe sites return to start another cycle of pinyon-juniper dominance.

*Referenced from (Hood and Miller 2007; Stebleton and Bunting 2009; USDA 2000c, 2006, 2009a).

Forests

Forested vegetation covers the middle and higher elevation portion of the Mitchell Spring project area. At middle elevations are stands of ponderosa pine. Higher elevation stands are a mixed conifer complex including Douglas-fir, white fir, juniper, ponderosa pine, limber pine (*Pinus flexilis*), and aspen. Gambel oak (*Quercus gambelii*), sagebrush, and greenleaf manzanita (*Arctostaphylos patula*) are the major plant species in the ponderosa pine and mixed conifer understories. Most acres of forestland within the project area have previously received various harvest and other silvicultural treatments.

On about 108 acres within a previous sanitation/salvage treatment area, manzanita is inhibiting natural conifer regeneration. Most of the natural regeneration that is occurring is undesirable juniper (75 trees per acre) and white fir (100 trees per acre). Currently ponderosa pine regeneration is around 100 trees per acre, while desired is 158 trees per acre.

Within about 1,110 acres of forest stands, tree densities and species composition are not within the desired condition. Some sites have high tree densities that limit growth and vigor, increasing the potential of tree mortality from insects and disease. For example, tree densities outside of the desired condition (≥ 250 trees/acre) have contributed to a Douglas-fir beetle (*Dendroctonus pseudotsugae*) outbreak that has created patches of mortality averaging 5 to 15 trees per acre within sites where Douglas-fir exist (USDA 2013a). Table 5 summarizes existing and desired conditions for forests.

Desired condition for forest stands as well as habitat condition is also evaluated by the vegetative structural stage (VSS)¹ in which the forest stand or habitat is currently expressed. The VSS categorizes the forest successional stage, canopy cover percentage, and the number of canopy layers for each area of analysis. The habitat quality of the northern goshawk is typically evaluated using VSS analysis. Within the proposed treatment area; VSS is currently below the target values defined in the Forest Plan.

¹ Vegetation structural stage (VSS) is a method of describing the growth stages of a stand of living trees. It is based on tree size (DBH) and total canopy cover. Overall, the VSS is dependent on the time it takes seedlings to become established and subsequent growth rates. Life expectancy of trees determines how long the oldest VSS can be. There are six VSS classes defined by Reynolds et al.1992: **grass-forbs/seedlings (class 1)** – Few trees greater than 1 inch DBH present. **seedling/sapling (class 2)** – Saplings, 1inch up to less than 5 inches in DBH, **young forest (class 3)** – Trees 5 inches DBH up to less than 12 inches DBH. **mid-aged forest (class 4)** – Trees 12 inches DBH up to less than 18 inches DBH, **mature-forest (class 5)** – Trees 18 inches DBH up to less than 24 inches DBH, **old-forest (class 6)** – Trees 24 inches DBH and greater

Table 5. Existing and desired condition for forests.

Existing Conditions of Forests	Desired Condition of Forests
Structure - Within ponderosa pine stands stand density index (SDI) averages 291. VSS 3 and 4 size classes dominate the project area. Within mixed conifer stands, SDI averages 271 with basal area exceeding 100 sq. ft.	Structure - VSS classes are distributed consistent with Forest Plan desired conditions. Not more than 50 percent of stands have multiple canopies. Stand Density Index (SDI)² within mixed conifer stands not greater than 298 and basal area less than 160 sq. ft./acre. Within ponderosa pine stands stand density index not greater than 158 and basal area less than 120 sq. ft./acre.
Composition - Within mixed conifer stands white fir composition averages about 38 percent. Within ponderosa pine stands, composition of ponderosa pine is less than 75 percent due to shade tolerant species such as white fir and juniper increasing in understory.	Composition - Within ponderosa pine stands, composition of ponderosa pine at 75 percent or more. Within mixed conifer stands true fir composition is less than 25 percent.
Processes - Douglas-fir (mixed conifer) bark beetles are present in outbreak levels. Patches of mortality average 5 to 15 trees and can exceed 1 acre in size. Small patches of 2 to 3 acres in size exist along edge of project area suffering from spruce budworm defoliation. Processes (ponderosa pine) - Dwarf mistletoe is found in patches throughout the pine cover type. Insects are at endemic populations, but within increasing tree density, susceptibility of bark beetle attack is expected to increase.	Processes (mixed conifer) - Endemic insect and disease populations with less than 50 percent crown defoliation. Tree mortality is less than 5 trees/acre in groups of less than 10 trees. Less than 15 percent of acres with root disease centers. A non-lethal and mixed severity fire regime. On dry sites the interval ranges from 10 to 25 years and typically is a non-lethal surface fire. On cooler, wetter sites, the interval is longer (30 to 50 years) and fires burn under the mixed severity regime. Fires of low to moderate severity open dense stands of pole-sized or larger trees. Processes (ponderosa pine) - Endemic insect and disease populations. Pockets of mortality do not exceed 5 trees/acre. Mortality groups of <10 trees. <1 percent of trees with black stain, <10 percent with root disease, <20 percent with dwarf mistletoe or stem rust. Fire regime is non-lethal type with a fire return interval of 5 to 25 years representative of fire regime 1.
Patterns - Single-storied stand structure exceeds 50 percent of the forested landscapes. About 1,000 acres of ponderosa pine and mixed conifer stands are identified as needing structure and composition changes when compared to the desired condition. Remaining acres of forests in project area are trending or meeting desired conditions due to past treatments.	Patterns (mixed conifer) - Patterns are within historical ranges. (Pattern sizes, shapes and corridors are maintaining processes.) Fire's role on dry and mesic sites is to prevent a shade-tolerant understory from developing Patterns (ponderosa pine) - Patterns are within historical ranges. (Pattern sizes, shapes and corridors are maintaining processes.) Periodic fires created uneven-aged stands composed of various even-aged groups.

² Stand density index (SDI) – An index value based on the relationship between number of trees per acre and their average diameter **Reineke, L.H. 1933**. Perfecting a stand-density index for even-aged forests. Journal of Agricultural Research. 46:627-638.. It is premised on the characteristic distribution of tree sizes in even-aged stands. The index is the number of trees per acre at an average stand diameter of 10 inches diameter breast height (DBH). The index is not influenced by age and site quality. Although SDI and the maximum size-density relationship were originally described for pure, even-aged stands, Long and Daniel (1990) have proposed extension of its utility to uneven-aged and multi-aged situations. The maximum SDI varies for each tree species and is measured at a given reference diameter **Long, J.N.D., T.W. 1990**. Assessment of growing stock in uneven-aged stands. Western Journal of Applied Forestry. 5(3): 93-96.. At 25 percent of maximum SDI, trees begin competing with each other and begin to out-compete understory vegetation. At 35 percent of maximum SDI, trees fully occupy the site. At higher densities, competition between trees either results in reduced growth and vigor on individual trees or may result in competitive stress and tree mortality **Long, J.N. 1985**. A practical approach to density management. Forestry Chronicle. 61:23-27.

Fuels and Fire Danger - The majority of the project area is Fire Regime Condition Class (FRCC)³ 2 or 3 (fire regimes have been moderately or significantly altered from the historical range and fire frequencies have missed multiple return intervals). There are moderately high dead and down fuel loadings and high 1 hour fuel loadings. In ponderosa pine stands there is typically a low crown base height (the green mass of the tree is closer to the ground than normal) and trees are therefore more susceptible to torching and crown fire). The area's principal road is closed, thus limiting access for ground-based fire detection and suppression.	Fuels and Fire Danger - Natural fire occurs at historic return intervals. Most of the project area is returned to FRCC 1, with fire regimes within historical range and risk of losing key ecosystem components to fire is low. There is moderate to low dead and down fuel loading and moderate to low 1 hour fuel loading. In ponderosa pine stands there is a higher crown base height making trees resistant to torching and crown fire. Road classifications allow access for ground-based fire detection and suppression
Goshawk Home Range - Forested acres are almost exclusively VSS 3 and 4 within project area.	Goshawk Home Range - When initiating vegetative management treatments in forested cover types, provide for a full range of seral stages, by forested cover type, that achieve a mosaic of habitat conditions and diversity. Each seral stage should contain a strong representation of early seral tree species. Recruitment and sustainability of each seral tree species in the landscape is needed to maintain ecosystem resilience to perturbations(USDA 2000e: CC-21). This is recognized to be a ratio of 10 percent VSS1, 10 percent VSS 2, 20 percent VSS 3, 20 percent VSS 4, 20 percent VSS 5, and 20 percent VSS 6 in ponderosa pine and mixed conifer(Reynolds et al. 1992: 7).
Old Growth - The Birch Creek Subwatershed has an estimated 10,585 acres of forests and woodlands having old growth characteristics, or 36 percent of the watershed.	Old Growth - A portion of each drainage should be in each age class. Seven to 10 percent should be managed as old growth and no less than 10 percent should be grassland (USDA 1986: IV-35). Planned vegetative management treatments in the mature and/or old structural groups (VSS 5 and 6) in a landscape that is at or below the desired percentage of land area in mature and old structural stages should be designed to maintain or enhance the characteristics of these structural stages (USDA 2000e: CC-21).

Referenced from (USDA 2000c, 2006, 2009a).

³ The Fire Regime Condition Class (FRCC) Standard Landscape Worksheet Method and Mapping Method provide tools for fire, vegetation, and fuels assessment and management at both the landscape and stand levels. These methods are used to describe general landscape fire regime and vegetation-fuel characteristics. Estimates of these characteristics are calculated for comparison with estimates of natural fire regime reference values and reference condition vegetation-fuel characteristics to index fire regime condition class (a classification of the amount current conditions have departed from those of historical reference conditions) **Barrett, S., Havlina, D., Jones, J., Hann, W., Frame, C., Hamilton, D., Schon, K., Demeo, T., Hutter, L., and Menakis, J. 2010.** Interagency fire regime condition class guidebook. <https://www.frames.gov/partner-sites/frcc/frcc-guidebook-and-forms/>.

Northern Goshawk Home Range

Northern goshawk nesting home ranges consist of three components: a nest area, a post-fledgling area (PFA), and a foraging area (Reynolds et al. 1992). The home range averages about 6,000 acres and should consist of forested stands in a wide range of all structure and age classes to meet shelter and foraging needs for both the goshawk and its prey species. Within the Mitchell Spring project area there are portions of three northern goshawk home ranges: Hall Creek, Jake Hollow, and Under Barney. Table 5 describes general VSS conditions in the project area and Table 6 describes the desired condition along with the current existing condition for each northern goshawk home range. As shown, within all home ranges, vegetation structural stages (VSS) 3 and 4 dominate the landscape, with both older and younger stages generally lacking.

Table 6: Current VSS Distribution by Northern Goshawk Home Range – Mitchell Spring Project Area (Gustafson 2014).

Home Range	Vegetative Structural Stage (VSS), percent of Total Forested Acres					
	1	2	3	4	5	6
	Grass/Forb/ Seedlings > 1.0" dbh*	Saplings 1.0"- .99" dbh	Young Forest 5"- 11.9" dbh	Mid-Aged Forest 12"-17.9" dbh	Mature Forest 18"- 23.9" dbh	Old Forest 24" + dbh
Desired Condition	10	10	20	20	20	20
Hall Creek	0	0	66	28	0	5
Jake Hollow	0	1	62	34	1	3
Under Barney	0	1	86	10	3	0

*dbh = diameter at breast height (breast height = 4.5 feet)

Wildland Urban Interface

The Davis Point/Main Canyon area was designated a community at risk from wildfire in 2001 (Federal Register 2001b). This community at risk consists of a corridor of private lands along FH 17 and Birch Creek, with many parcels containing houses and other structures. The National Forest lands that surround these private lands are referred to as the wildland urban interface (WUI) where the unoccupied wildlands meet human development (Five County Association of Governments 2007). Within the WUI, tree densities are high and fuels are continuous to the private property lines. Private lands, including their improvements and structures and human occupants, face a threat from wildfire. Conversely, there is a threat of wildfire coming from these private lands onto the forest and causing damage to forest resources. Forest Service regulations provide for special attention to WUIs to reduce wildfire intensity and create defensible space around the WUI, and protect National Forest lands from unwanted fire. Table 7 summarizes existing and desired conditions for the project area's WUI.

Table 7. Existing and desired conditions for the wildland urban interface.

Existing Condition of WUI	Desired Condition of WUI
Vegetation conditions in a 300-foot buffer around private lands are the same as described previously under the existing condition for shrubland, woodland, and forests. Fire suppression and protection conditions are not satisfactory.	A 300-foot buffer area around private property has vegetation features that result in wildfire of low intensity, therefore meeting fire protection objectives and allowing fire suppression forces to use direct attack tactics.

Referenced from (USDA 2000d: IV-54).

Transportation System

The 2009 DNF Motorized Travel Plan (MTP) Record of Decision (ROD) designated the motorized travel system and amended the Forest Plan to prohibit motorized off-road travel. With this decision Little Jake Road (formerly FSR 30150), former FSR 30538, and other classified system roads were closed. Since its construction during the 1970s, Little Jake Road had served as a motorized route for vegetation management, fire suppression, and recreational access. Although closed, the road surface is in good condition, has not yet been obliterated or decommissioned, and is currently experiencing unauthorized use by motorists. A portion of former FSR 30150 (1.49 miles) and all of former FSR 30538 (0.79 miles) are surrounded by but not included in the Jake Hollow IRA. Early in the Mitchell Spring analysis a review of the motorized travel management plan for the project area was conducted using a Transportation Analysis Process (TAP)(USDA 2012). The TAP report identified former FSRs 30150 and 30538 as needed to meet long term forest resource management objectives and to provide for motorized recreation opportunities.

FSR 30151 (4.27 miles) connects Forest Highway 17 with the upper portion of FSR 30150 (Little Jake Road) and like Little Jake Road, FSR 30151 accesses the Jake Hollow IRA. It is a narrow, winding, steep road used mainly by off road vehicles and is less suitable for road vehicles for accessing the Jake Hollow IRA than is the former FSR 30150 (Little Jake Road). Both to limit the number of roads in the project area and to designate use based on the actual operational maintenance level and condition of the roadway, it is desirable to convert FSR 30151 from an open road to a motorized trail. Table 8 identifies the existing and desired road system for the project area.

Table 8. Existing and desired minimum road system and minimum motorized trail system for the Mitchell Spring project area.

Operational Maintenance Level	Existing Road/Motorized Trail System	Desired or Minimum Road/Motorized Trail System	Change
	(miles)	(miles)	(miles)
1 - Basic Custodial Maintenance (Administrative)	2.59	2.59	0.00
2 - High Clearance Vehicles	4.55	2.56	-1.99
3 - Suitable For Passenger Cars	5.5	5.5	0.00
4 - Moderate Degree Of User Comfort	0	0	0.00
5 - High Degree Of User Comfort	0	0	0.00
Seasonal Road (high clearance)	0	4.02	4.02
Total for forest system roads	12.64	14.67	2.03
Motorized Trail	0	4.27	4.27
Total for forest motorized trail system	0	4.27	4.27
Total Road and Motorized Trail System	12.64	18.94	6.3

PURPOSE AND NEED FOR ACTION

Based on the analysis of current and desired conditions, and the gap between them, the purpose for this project is to: (1) establish and maintain desired conditions for vegetation within the Mitchell Spring project area to improve forage and habitat for wildlife; (2) reduce wildfire intensity and create defensible space around the wildland urban interface (WUI), and protect forest resources from unwanted fire; and (3) provide access to the Mitchell Spring area for public and administrative purposes. This purpose translates into the following specific needs:

1. There is a need to remove encroaching conifers from up to 30 acres of shrublands to maintain desired vegetation structure and composition and to improve forage conditions for wildlife.
2. There is a need to improve and maintain desirable forested conditions such as growth rates, vigor, stocking, structure, species composition, resilience to agents of disturbance, and VSS classes for northern goshawk habitat on up to 1,080 acres.
3. There is a need to reduce risk of severe fire behavior within the WUI that could impact people, property, and natural resource values on up to 395 acres.

4. There is a need to update the Dixie National Forest Travel Management Plan to provide an additional 4.02 miles of seasonal roads, remove 1.99 miles of operation maintenance level 2 roads from the road system, and convert 4.27 miles of open road to a motorized trail to meet the variety of uses occurring within the project area while protecting the natural resources.

MODIFIED PROPOSED ACTION

In summary, the actions proposed by the Forest Service to meet the purpose and need are:

Action 1 – Pinyon-Juniper Control

Up to 30 acres of shrublands would have encroaching pinyon pine and juniper removed to improve shrubland vegetation structure and composition, and to improve forage for wildlife. A combination of mechanical methods would be used, including hand thinning, mastication, and mowing. This action responds to Purpose and Need 1.

Action 2 – Ponderosa and Mixed Conifer Group Selection

The Forest Service proposes to treat about 647 acres of ponderosa pine stands and 124 acres of mixed conifer stands for a total of 771 acres with a group selection regeneration harvest. Of the 771 acres designated to be treated with a group selection regeneration harvest, up to 154 acres would consist of a series of patch cuts to provide conditions favorable for natural regeneration of conifers. Each patch cut would be from ½ to 2 acres in size. This will increase VSS class 1 and 2 representation while decreasing VSS 3 and 4 representation that moves these stands towards VSS desired conditions to improve goshawk habitat. To improve growth and vigor of trees between the group selection openings, individual trees would be removed to a target density of 60 sq. ft. of basal area within ponderosa pine stands and 80 sq. ft. of basal area within mixed conifer stands in areas outside of goshawk post fledgling areas (PFAs). Within PFAs, individual trees would be removed to a target density of 80 sq. ft. of basal area within ponderosa pine stands and 90 sq. ft. of basal area within mixed conifer stands. Non-commercial size trees would be thinned down to approximately 300 trees per acre to improve species composition and manage dwarf mistletoe (*Arceuthobium spp.*). Following harvest activities, the cutting units would receive a prescribed fire treatment to remove activity generated surface fuels, prepare created openings for natural regeneration by seed, and reduce understory densities of white fir and juniper. This action responds to Purpose and Need 2.

Action 3 – Artificial Reforestation with Site Preparation

Treatment Unit 8 would receive a fill-in planting over the 108-acre area with 1 year old containerized ponderosa pine seedlings. Tree seedlings would be from locally collected seed similar to the original stand. Seedling spacing would be 13 feet, which equates to 258 trees per acre.

The treatment unit is currently dominated by a manzanita understory. One to two years prior to the planting, a site preparation treatment would be undertaken to reduce competition from manzanita. This would be accomplished using prescribed fire and/or mowing. This action responds to Purpose and Need 2.

Action 4 – Ponderosa Pine Stand Improvement

About 201 acres of ponderosa pine stand are identified for a pre-commercial thinning to reduce tree densities, improve species composition and provide opportunity for increased growth and vigor for the retained trees. The treatment is designed to reduce pinyon-juniper tree densities within the ponderosa pine forest understories. The targeted stand density index is 140 which equates to about 134 trees per acre with the focus on retention of ponderosa pine. To reduce hazardous fuels adjacent to open roads, slash within 100 feet of a road would be lopped and piled for subsequent burning (in Treatment Unit 12, adjacent to IRA, piles would be made on north side of FSR 30151). Cut tree boles would be retained and made available for personal firewood use. This action responds to Purpose and Need 2.

Action 5 – Wildland Urban Interface Treatment

Shaded fuel breaks would be created on an estimated 395 acres adjacent to private lands for the purpose of reducing potential wildfire intensity and creating defensible space. See Chapter 2 for a detailed discussion of the wildland-urban interface treatments. This action responds to Purpose and Need 3.

Action 6 – Use of Roads and Update to the Transportation Plan*Temporary Roads*

The Modified Proposed Action would require use of an estimated 1.92 miles of temporary roads. All of the proposed temporary roads are closed routes or temporary roads from past harvest entries (see Table 11).

All temporary roads would be reconstructed to the minimum standard to allow a loaded log truck with tractor and trailer to safely negotiate the terrain from the log landing to the haul road. All temporary roads would be decommissioned following harvest activities. Road decommissioning would follow one or more of the methods defined within FSM 7734.1: *Decommissioning Treatments Road Reclassification*.

Road Reclassification

With the Modified Proposed Action, approximately 6.30 miles of roads would be added to the National Forest System. Another 4.27 miles would be converted from an open road to a motorized trail. Adding 6.30 miles and subtracting 4.27 miles gives a net gain of open roads of 2.03 miles (see Table 8).

The 6.30 miles of proposed new road were identified as needed for implementation of the Mitchell Spring Vegetation Improvement Project as well as for future forest resource management (USDA 2012). The new roads also restore motorized recreational opportunities within the project area. Former FSR 30150 (5.36 miles) and former FSR 30538 (0.79 miles) were closed in the 2009 MTP decision; these former roads are proposed to be reopened, adding a total of 6.30 miles to the system. A 0.15 mile section of former FS 30150, currently classified as a non-motorized trail, is proposed to be opened to shared use (Griffin Point Trail section).

About 4.02 miles of former FSR 30150 would be managed with a seasonal restriction to benefit wildlife habitat needs. Specifically, the road segment would be closed to vehicles during times when goshawk nests are active or the territory is occupied.

FSR 30151 (4.27 miles) is currently an open forest road and would be used to access treatment areas during project implementation. Following project completion, FSR 30151 would be converted from an open road (high clearance vehicles) to a motorized trail.

This action responds to Purpose and Need 4.

DECISION FRAMEWORK

Given the purpose and need, the deciding official reviews the Modified Proposed Action and the other alternatives in order to make the following decisions:

- Whether the Modified Proposed Action (Alternative 2) will proceed as proposed, be replaced by Alternative 3, or be modified by combining it with elements from Alternative 3. If none of these is selected the Forest Service will continue to implement current management pursuant to existing guidance (Alternative 1, No Action).

PUBLIC INVOLVEMENT

The Mitchell Spring proposal was listed in the Schedule of Proposed Actions on June 21, 2014. The proposal was provided to the public and other agencies for comment during scoping (June 21, 2014 to July 21, 2014). Two letters were received and 72 comments were extracted from the letters. The interdisciplinary team reviewed all 72 public comments to identify issues for this proposal. Several issues or unresolved conflicts were identified through scoping that would indicate a need for additional alternatives. Also, based on public and internal comments the Proposed Action was modified and Alternative 2 was renamed to Modified Proposed Action.

The initial proposal in the scoping notice listed seven actions, one of which proposed removal of pinyon-juniper from a cottonwood-willow stand along Birch Creek. One commenter questioned whether this action was needed, suggesting that the action had already been taken. Forest Service analysis concluded that the commenter was referring to an earlier pinyon-juniper treatment completed under the Birch Creek Riparian project. It was also determined that the actual area available for pinyon-juniper removal was much smaller than had been stated in the scoping notice. To avoid confusion with the previous project, and in recognition of the limited gain to be made by implementing this action on such a small area, that action was removed from the Proposed Action. Therefore, Alternative 2 is now the Modified Proposed Action.

The Modified Proposed Action, as described in this document, now contains six actions. These six actions are the same as in the scoping notice, although the descriptions have, in some cases, been revised to more clearly describe the action being proposed.

ISSUES

Issues arising from the public scoping process were separated into two groups: “key” and “non-key.” Key issues were defined as those directly or indirectly caused by implementing the Proposed Action and requiring the consideration of modification of the Proposed Action (Modified Proposed Action, Alternative 2) or the development of a new alternative (Alternative 3). Non-key issues were identified as those: (1) outside the scope of the Proposed Action; (2) already decided by law, regulation, Forest Plan, or other higher level decision; (3) irrelevant to

the decision to be made; (4) conjectural and not supported by scientific or factual evidence; (5) general comment, opinion, or position statement; (5) part of the Proposed Action/Purpose and Need; or (6) component of the Environmental Document and/or Project Record. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7:

“identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)”. A list of key and non-key issues and reasons regarding their categorization is located in the Comment Analysis in the project record.

The Forest Service identified the five topics below raised during scoping as key issues.

1. **Unroaded/Undeveloped:** Treatments that are proposed within unroaded/undeveloped designated areas could result in land character change which removes these acres from that designation.
2. **Reforestation without Site Preparation:** Prescribed fire or mowing site preparation actions within the reforestation unit could damage established regeneration and interrupt the successional development in the stand that exists.
3. **Transportation Plan:** With the exception of FSR 30151 and FSR 30150, the actions decided in the Dixie Motorized Travel Plan ROD should be implemented in order to protect the resources that led to that decision. Because FSR 30151 is poorly located, it should be closed and the acres restored; FSR 30150 should be designated an administrative route so that fire protection actions can proceed.
4. **Temporary Roads:** Construction of temporary roads could increase soil disturbance.
5. **Northern Goshawk Nest Areas:** Vegetation treatments within the nest areas could negatively affect goshawk habitat.

CHAPTER 2 – ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the Mitchell Spring project. It includes a description and map of each alternative considered. This chapter also presents the alternatives in comparative form, defining the differences between each alternative and providing a basis for choice among options by the decision maker and the public.

ALTERNATIVES

This chapter describes three alternatives: Alternative 1 No Action, Alternative 2 Modified Proposed Action, and Alternative 3. No Action provides a baseline for considering the other alternatives, collectively termed “the action alternatives.” The Modified Proposed Action expands on the summary description presented in Chapter 1. Alternative 3 addresses the key issues described at the end of Chapter 1.

Alternative 1 No Action

Under the No Action Alternative, current management plans would continue to guide management of the project area. Changes to the Forest’s travel management plan would not occur. No vegetation treatments such as timber harvest, stand improvement thinning, or artificial reforestation would be implemented to accomplish project objectives. Also there would be no means to affect the potential impacts to the WUI, unauthorized road use, declining forest growth, and insect and disease outbreaks.

Alternative 2 Modified Proposed Action

Five actions are proposed to meet the purpose and need to manage vegetation towards the desired conditions of the Forest Plan within the Mitchell Spring project area and one action involves transportation management. Table 9 summarizes the vegetation management treatments described in the Modified Proposed Action’s actions 1 through 5. Figure 8 presents a graphic depiction of the Modified Proposed Action, and Figure 9 shows the transportation system for the Modified Proposed Action.

Table 9. Summary of treatments and acres of the Modified Proposed Action, by treatment unit.*

Treatment Units	Group Selection	Ponderosa Pine Improvement	Reforestation	Tree Control	WUI Fuels Reduction	Grand Total
1 ⁴						0
2				11		11
3				19		19
4	177					177
5	147					147
6	23					23
7	424					424
8			108			108
9		84				84
10		37				37
11		34				34
12		46				46
13					190	190
14					205	205
Grand Total	771	201	108	30	395	1,505

* All acres have been rounded to nearest whole number.

Action 1 – Pinyon-Juniper Control

This action addresses the need to remove encroaching conifers from up to 30 acres of shrublands to improve shrubland vegetation structure and composition, and to improve forage conditions for wildlife.

Treatment Units 2 and 3 (30 total acres)

Up to 30 acres of shrublands would have encroaching pinyon pine and juniper removed to improve forage for wildlife and domestic livestock. A combination of mechanical methods would be used, including hand thinning, mastication, and mowing.

Specifications for treatments include:

- Cut all pinyon pine and juniper species within treatment units. Retain other tree species that may be present.
- All snags would be retained.
- Lop and scatter branch and limb slash within cutting units to a height of less than 3 feet. Reserve cut tree boles for personal firewood use.

⁴ No actions are proposed for Treatment Unit 1. It is included because it is within the project area.

Action 2 – Ponderosa and Mixed Conifer Group Selection

This action addresses the need to improve and maintain desirable forested conditions in goshawk habitat such as growth rates, vigor, stocking, structure, species, and resilience to agents of disturbance.

Treatment Unit 4- Mixed Conifer Prescription (177 total acres)

Treatment Units 5, 6, and 7- Ponderosa Pine Prescription (594 total acres)

This treatment is designed to improve and maintain tree vigor, species composition, and resilience to agents of disturbance. This action also is designed to improve habitat for the northern goshawk through modification of current vegetative structure. Group selection is a method of regenerating forest stands in which groups of trees are removed, and new age classes of trees are established in the created openings. The minimum width of groups is approximately twice the height of the mature trees, with a maximum opening of 2 acres. The objective would be to balance tree size classes (VSS) within forest stands while maintaining or promoting an uneven-aged structure.

The Forest Service proposes to treat about 594 acres of ponderosa pine stands and 177 acres of mixed conifer stands for a total of 771 acres with a group selection regeneration harvest. Up to 154 acres would have ¼ to 2 acre openings created in the overstory for the purpose of providing conditions suitable for natural regeneration of conifers. To improve growth and vigor of trees between the openings, individual trees would be removed to a target density of 60 sq. ft. of basal area within ponderosa pine stands and 80 sq. ft. of basal area within mixed conifer stands in areas outside of goshawk PFAs. Within PFAs, individual trees would be removed to a target density of 90 sq. ft. of basal area within ponderosa pine and 90 sq. ft. of basal area within mixed conifer stands. Non-commercial size trees would be thinned down to approximately 300 trees per acre to improve species composition and manage dwarf mistletoe. Following harvest activities, the cutting units would receive a prescribed fire treatment to remove activity generated surface fuels, prepare created openings for natural regeneration by seed, and reduce understory densities of white fir and juniper.

Specifications for treatments include:

- Treatment Unit 7, encompassing portions of the Hall Creek northern goshawk nest areas and located within the Hall Creek post-fledgling areas, will have a no activity timing restriction from March 1 to September 30 if the territory is determined to be active or occupied.
- During timber sale layout, within Treatment Unit 7, the northern goshawk nest site(s) and two alternate nest sites will be designated and a 30 acre no treatment buffer will be placed around each site.
- Within Treatment Unit 7, located within the Hall Creek northern goshawk post-fledgling areas, tree densities outside of the group openings will be thinned to 90 sq. ft. of basal area within ponderosa pine cover types and 90 sq. ft. of basal area within mixed conifer cover types. To improve growth and vigor of trees between the group selection openings, individual trees would be removed to a target density of 60 sq. ft. of basal area within

ponderosa pine stands and 80 sq. ft. of basal area within mixed conifer stands in areas outside of goshawk post fledgling areas (PFAs).

- Ground based commercial harvest methods will be used.
- All snags, except those considered hazards near log landings or open roads, will be retained.
- Beetle infested and any dwarf mistletoe infected trees will be removed to eliminate infection source or isolate infected trees needed for wildlife habitat and future snags.
- When determining the tree species to be retained the order of priority will be, first, ponderosa pine, followed by limber pine, Douglas-fir, and white fir. Aspen, bristlecone pine, and Gambel oak will not be designated for cutting or considered in tree spacing.
- Slash not yarded to landings as forest products (i.e., fuelwood, biomass or post and poles) will be lopped and scattered in preparation of prescribed fire. Landing and other slash piles will be burned.
- Where scientifically indicated and consistent with applicable laws and guidance, broadcast prescribed fire would be applied for slash disposal, control of undesirable tree densities, and site preparation to promote natural regeneration.
- Where excessive amounts of slash are generated (generally 15 tons per acre in ponderosa pine forest and 20 tons per acre in mixed conifer forest), piling and burning may occur prior to broadcast prescribed fires.
- As described within project design feature (WL-4), retention of large down logs is preferred and retained coarse woody debris should average 50 to 150 tons per 10 treated acres depending on forest cover type.
- Stocking surveys will be conducted as outlined in FSH 2409.17 Silvicultural Practices Handbook. If group patch cuts have not naturally regenerated with desirable conifer species to a minimum of 150 seedlings per acre, site preparation and artificial reforestation will occur. Containerized stock will be planted with ponderosa pine to achieve a stocking of 258 seedlings per acre. This equates to 13 foot spacing. Site preparation for tree planting will consist of clearing away all competing vegetation and scalping the exposed soil surface to a depth of ½ inch within an 18 inch x 18 inch area for each seedling.
- Timber harvest operations and landings will be located off of Main Canyon Road (FH-17), and will not obstruct traffic flow.

Action 3 – Artificial Reforestation with Site Preparation

This action addresses the need to improve and maintain desirable forested conditions such as growth rates, vigor, stocking, structure, species, and resilience to agents of disturbance.

Treatment Unit 8 (108 total acres)

Treatment Unit 8 will receive a fill-in planting with 1 year old containerized ponderosa pine seedlings. Tree seedlings will be from locally collected seed similar to the original stand. Seedling spacing would be 13 feet, which equates to 258 trees per acre.

The treatment unit is currently dominated by a manzanita understory. One to two years prior to the planting, a site preparation treatment will be undertaken to reduce competition from manzanita, where needed. This would be accomplished using prescribed fire and/or mowing, with the intention that neither of these actions removes existing native ponderosa pine regeneration. Other specifications for treatments include:

- Site preparation during tree planting will consist of clearing away all competing vegetation and scalping the exposed soil surface to a depth of ½ inch within an 18 inch x 18 inch area for each seedling.
- Stocking surveys will be conducted as outlined in FSH 2409.17, Silvicultural Practices Handbook.
- Microsite planting: Plant on the north side of logs, stumps and other debris where possible. Sites for planting will be selected on the basis of maximizing expected seedling survival.
- Planting spacing will be irregular to develop a clumpy stand structure.

Action 4 – Ponderosa Pine Stand Improvement

This action addresses the need to improve and maintain desirable forested conditions such as growth rates, vigor, stocking, structure, species, and resilience to agents of disturbance.

Treatment Units 9, 10, 11, and 12 (201 total acres)

About 201 acres of ponderosa pine stand are identified for a pre-commercial thinning to reduce tree densities, improve species composition, and provide opportunity for increased growth and vigor for the retained trees. The treatment is designed to reduce pinyon-juniper tree densities within the ponderosa pine forest understories. The targeted stand density index is 140 which equates to about 134 trees per acre with the focus on retention of ponderosa pine. To reduce hazardous fuels adjacent to open roads, slash within 100 feet of a road would be lopped and piled for subsequent burning. Cut tree boles would be retained and made available for personal firewood use. Specifications for treatments include:

- Hand thinning methods will be used.
- All snags will be retained.

- Beetle infested and any dwarf mistletoe infected trees will be removed to eliminate infection source. When determining the tree species to be retained the order of priority would be, first, ponderosa pine, followed by Douglas-fir, and white fir. Aspen, bristlecone pine, limber pine, and Gambel oak will not be cut or considered in tree spacing.
- Lop branches and pile slash within 100 feet of FSR 30151. Lop and scatter branch and limb slash within remainder of cutting units to a height of less than 3 feet. Reserve cut tree boles for personal firewood use.
- Slash piles along FSR 30151 would be piled and either burned or left for firewood. Slash piles in Unit 12 adjacent to the IRA would be piled to the north of FSR 30151; no piles would be made or burning treatments would occur within the IRA.
- Implementation monitoring of tree removal and thinning would follow procedures outlined in FSH 2409.17_6.4 and documented using a Thinning Inspection Plot Form R4-2400-4.

Action 5 – Wildland Urban Interface Treatment

This action addresses the need to reduce risk of severe fire behavior within the WUI that could impact people, property, and natural resource values on up to 395 acres.

Treatment Units 13 and 14 (395 total acres)

Shaded fuel breaks⁵ would be created on an estimated 395 acres adjacent to private lands for the purpose of reducing potential wildfire intensity and creating defensible space. Specifications for treatments include:

WUI in Forested Areas

- In forested areas, create defensible space around adjacent private property by thinning conifers (primarily ponderosa pine and pinyon-juniper) such that the distance between tree canopies or scattered groups of trees is at least 20 feet apart.
- Priority for tree retention would be given to ponderosa pine and mixed conifer species greater than 8 inches diameter at breast height (dbh). These trees would be limbed up to six feet in order to reduce ladder fuels.
- Ladder fuels such as shrubs and conifers with a dbh of less than 8 inches and occurring within the drip-line of leave trees would be removed to limit transition of ground fire into tree crowns.
- All cut materials would be chipped, mulched, piled and burned, or broadcast burned.

⁵ A shaded fuel break is an area adjacent to private property and/or other areas where fire prevention is desirable and where vegetation is treated to diminish the intensity of wildfire. Altering vegetation structure and reducing fuel loads are typical treatments. Following treatment a shaded fuel break retains significant amounts of vegetation and continues to support ecological functioning. It differs from a fire break, where all vegetation is removed to non-burnable mineral soil.

- No commercial timber harvest is proposed in the WUI treatment area; personal and commercial fuelwood gathering may be authorized.
- WUI treatment areas would be approximately 300 feet wide.
- WUI treatment areas would be monitored post treatment. As fuel loadings and vegetative re-growth warrant, WUI treatment areas would be maintained through hand pruning, chainsaws, chipping, mulching, mowing, and/or piling and burning.

WUI in Non-Forested Areas

- In non-forested areas defensible space would be created around adjacent private property by mulching and/or mowing brush and grasses to less than 1 foot in height.
- WUI treatment areas would be approximately 300 feet wide.
- WUI treatment areas would be monitored post treatment. As fuel loadings and vegetative re-growth warrant, WUI treatment areas would be maintained through hand pruning, chainsaws, chipping, mulching, mowing, and/or piling and burning.

Action 6 – Use of Roads and Update to the Transportation Plan

The action addresses the need to access treatment areas and to update the Dixie National Forest Travel Management Plan to meet the variety of uses occurring within the project area while protecting the natural resources.

Existing Roads

Areas that would be treated as described in actions 1 through 5 above would be accessed using designated open roads and administrative use only roads. An estimated 18.94 miles of designated open and administrative roads are identified for use for the purpose of accessing treatment units and for hauling forest products to processing mills. Table 10 identifies designated open and administrative routes that would be used to access Modified Proposed Action treatment areas (see also Table 9).

Table 10. Designated open and administrative routes used by the Modified Proposed Action.

Route Number	Route Length (miles)	Operational Maintenance Level
30151	4.27	Motorized Trail
33939	0.61	1 – Administrative Use Only
33942	0.59	1 – Administrative Use Only
33944	0.47	1 – Administrative Use Only
33946	0.82	1 – Administrative Use Only
30280	0.10	1 – Administrative Use Only
30538	0.79	2 – High Clearance Vehicles
31450	0.28	2 – High Clearance Vehicles
30150	1.49	2 – High Clearance Vehicles
30140	0.08	3 – Suitable for Passenger Car
FH 17	5.42	3 – Suitable for Passenger Car
30150	4.02	2 – High Clearance Vehicles Seasonal Restriction
Total	18.94	

Temporary Roads

The Modified Proposed Action would require use of an estimated 1.92 miles of temporary roads. All of the proposed temporary roads are either closed routes requiring new construction or temporary roads from past harvest entries.

Environmental analysis determined that unauthorized route G4092 comes within 100 feet of Hall Creek. Increased use of this route for project activities would have the potential to affect both shading and sedimentation into the adjacent section of Hall Creek. Using G4092 would have a negative impact on Colorado River cutthroat trout habitat in Hall Creek that would be difficult to mitigate based on its proximity to the stream. Therefore, use of route G4092 is removed from the Modified Proposed Action.

All temporary roads would be reconstructed to the minimum standard to allow a loaded log truck with tractor and trailer to safely negotiate the terrain from the log landing to the haul road. All temporary roads would be decommissioned following harvest activities. Road decommissioning

would follow one or more of the methods defined within FSM 7734.1: Decommissioning Treatments. Table 11 and Figure 8 shows proposed temporary roads.

Table 11. List of temporary roads to be used with the Modified Proposed Action.

Route Number	Current Allowable Use	Miles	Note	Disposition after Project
G4090	Decommissioned	0.54	Construction on Existing Roadbed	Decommission: barricade, waterbar, coarse woody debris, and/or ripping
U4560	Decommissioned	0.06	Construction on Existing Roadbed	Decommission: barricade, waterbar, coarse woody debris, and/or ripping
U4562	Decommissioned	0.11	Construction on Existing Roadbed	Decommission: barricade, waterbar, coarse woody debris, and/or ripping
T412	Decommissioned	0.09	Construction on Existing Roadbed	Decommission: barricade, waterbar, coarse woody debris, and/or ripping
T413	Decommissioned	1.03	Construction on Existing Roadbed	Decommission: barricade, waterbar, coarse woody debris, and/or ripping
31446	Decommissioned	0.63	Construction on Existing Roadbed	Decommission: barricade, waterbar, coarse woody debris, and/or ripping
Total		1.92		

Road Reclassification

With the Modified Proposed Action, approximately 6.30 miles of roads would be added to the National Forest System. These roads were identified as needed for implementation of the Mitchell Spring Vegetation Improvement Project as well as future forest resource management. The roads also restore motorized recreational opportunities both within the project area and outside of it to access recreational opportunities in the IRA. Former FSR 30150 and former FSR 30538 were closed in the 2009 MTP decision; these former roads are proposed to be reopened (see Modified Proposed Action Transportation Plan, Figure 9 and Table 12). A 0.15 mile section of former FS 30150, currently classified as a non-motorized trail, is proposed to be opened to shared use (Griffin Point Trail section). Approximately 4.02 miles of former FSR 30150 would be managed with a seasonal restriction to benefit wildlife habitat needs. Specifically, the road segment would be closed to vehicles during times when goshawk nests are active or the territory is occupied (see PDF WL-9 for periods of potential seasonal closure). FSR 30151 (4.27 miles) is currently an open forest road and would be used to access treatment areas during project implementation. Following project completion, FSR 30151 would be converted from an open road (high clearance vehicles) to a motorized trail.

The net result of this Modified Proposed Action of adding new open roads and converting an open road to a motorized trail would be to add 6.30 miles of new road to the forest road system and to reclassify 4.27 miles of open road as motorized trail. Table 12 summarizes proposed route reclassifications.

Table 12. Routes identified to be reclassified with the Modified Proposed Action (see Figure 9).

Route Number	Current Designation	Miles	Proposed Designation	Miles	Operational Maintenance Level
30150	Closed Classified	5.36	Open with Conditional Seasonal Restrictions (FH 17 to 30151)	3.87	2– High Clearance Vehicles Seasonal Restriction
			Open to All (Junction with FSR 30151 to FSR 30538)	1.49	2 – High Clearance Vehicles
30150	Non-motorized Trail	0.15	Shared used Open with Conditional Seasonal Restrictions and Non-motorized Trail	0.15	2 – High Clearance Vehicles Seasonal Restriction
30538	Closed Classified	0.79	Open to All	0.79	2 – High Clearance Vehicles
30151	2 – High Clearance Vehicles	4.27	Motorized trail	4.27	NA – for off-road vehicles only (Vehicle width restriction)

Alternative 3

Alternative 3 was developed to address key issues identified from public comments during the scoping period and from internal Forest Service comment analysis. Features of this alternative, which differ from the Modified Proposed Action, are listed below.

- 1. Unroaded-Undeveloped Area Designation:** No activities would occur within Dixie National Forest draft unroaded/undeveloped (UR/UD) area (see p. 5).
- 2. Reforestation without Site Preparation:** This feature implements reforestation without the use of prescribed fire to remove competing brush and undesirable trees species prior to planting of conifer seedlings. Existing tree densities of undesirable tree species and desirable regeneration of native ponderosa pine would remain.
- 3. Transportation Plan:** This feature closes and decommissions FSR 30151 and opens former FSR 30150 as an administrative route. It maintains the road closure for former FSR 30538 as outlined in the 2009 MTP ROD.
- 4. Temporary Roads:** No new temporary roads should be constructed to facilitate proposed vegetation treatments.
- 5. Northern Goshawk Nest Areas:** This feature protects northern goshawk species and habitat by proposing that no vegetation treatments occur within goshawk nest areas.

While there are distinctions between the Modified Proposed Action (Alternative 2) and Alternative 3, the same five vegetation action item headings used in Table 9 for Alternative 2 can be used for Alternative 3, and the resulting acreages compared between the two alternatives. Table 13 below summarizes the vegetation management treatment acres resulting from implementation of all five features of Alternative 3. Figure 10 presents a graphic depiction of Alternative 3.

Table 13. Summary of treatments and acres of Alternative 3, by treatment unit.*

Treatment Units	Group Selection	Ponderosa Pine Improvement	Reforestation	Tree Control	WUI Fuels Reduction	Grand Total
1	-	-	-	-	-	0
2	-	-	-	11	-	11
3	-	-	-	19	-	19
4	140	-	-	-	-	140
5	51	-	-	-	-	32
6	23	-	-	-	-	23
7	238	-	-	-	-	238
8	-	-	108	-	-	108
9		0				
10		0				
11		0				
12		0				
13	-	-	-	-	151	151
14	-	-	-	-	-	
Grand Total	452	0	108	30	151	741

*All acres have been rounded to nearest whole number.

Action 1 – Pinyon-Juniper Control

Same as Modified Proposed Action.

Action 2 – Ponderosa and Mixed Conifer Group Selection

Treatment Unit 4- Mixed Conifer Prescription (140 total acres)

Treatment Units 5, 6, 7 - Ponderosa Pine Prescription (312 total acres)

Implementation of this alternative (specifically Feature 5 relating to northern goshawk nest area(s)) would result in treatment of about 312 acres of ponderosa pine stands and 140 acres of mixed conifer stands for a total of 452 acres with a group selection regeneration harvest. Up to 90 acres would have ¼ to 2 acre openings created in the overstory for the purpose of providing conditions suitable for natural regeneration of conifers. All other components of Alternative 1 are the same as the Modified Proposed Action.

Action 3 – Artificial Reforestation without Site Preparation

Treatment Unit 8 (108 total acres)

With this alternative, there would be no use of prescribed fire or mowing to reduce competing vegetation such as shrubs or other trees prior to planting pine seedlings. All other components are the same as the Modified Proposed Action.

Action 4 – Ponderosa Pine Stand Improvement, No Treatment in Unroaded-Undeveloped

Implementation of this alternative (specifically Feature 1 of no treatments within the Dixie NF draft unroaded/undeveloped area) would result in no acres treated in Treatment Units 9, 10, 11, and 12 (which occur in their entirety within unroaded/undeveloped).

Action 5 – Wildland Urban Interface Treatment

Same as Modified Proposed Action except no treatment would occur in Treatment Unit 14 (which occurs in its entirety within unroaded/undeveloped).

Action 6 – Use of Roads and Update to the Transportation Plan*Existing Roads*

Same as the Modified Proposed Action.

Road Reclassification

With this feature of Alternative 3, approximately 5.36 miles of roads (former FSR 30150) would be added to the National Forest System as administrative use routes to provide access for current and future forest management (as opposed to the Modified Proposed Action plan to Open to All with seasonal restriction for wildlife). Following project completion, FSR 30151 would be closed and decommissioned (as opposed to Modified Proposed Action to convert it into a Motorized Trail). Former FSR 30538 would be decommissioned per the 2009 MTP ROD. No motorized route access to the IRA (via former FSR 30150 and FSR 30151) would be proposed. Table 14 and Figure 11 show roads reclassified by Alternative 3.

Table 14. Routes identified to be reclassified with Alternative 3.

Route Number	Current Designation	Miles	Proposed Designation	Miles	Operational Maintenance Level
30150	Closed Classified	5.36	Administrative Use Only (FH 17 to Junction with FSR 30151)	5.36	1 – Basic Custodial Care
30150	Non-motorized Trail	0.15	Shared Administrative Use and Non-Motorized Trail	0.15	1 – Basic Custodial Care
			Common with FSR 30150 and Trail 34038		
30538	Closed Classified	0.79	Non-Motorized Trail	0.79	NA
30151	2 – High Clearance Vehicles	4.27	Closed Classified	4.27	Decommission
Total		10.57		10.57	

DESIGN FEATURES COMMON TO ALL ACTION ALTERNATIVES

Project design features are project and site specific level measures that are to be taken to avoid or minimize impacts from implementation of proposed project activities. Design features derive from federal laws and regulations, established Forest Service policies, Forest Plan standards and guidelines, and best management practices. Design features are prepared by the interdisciplinary team specifically for this project, and are integral components of both action alternatives. Table 15 describes project design features for both the Modified Proposed Action and Alternative 3.

Table 15. Project design features for both action alternatives.

Wildlife
WL-1. Project activities shall cease which "May Affect" threatened, endangered, or proposed species discovered within or adjacent to the project area during project layout or implementation that have not been addressed within the environmental analysis until the potential affect is removed or until consultation with the U.S. Fish and Wildlife Service is concluded. Project implementation shall cease if any sensitive species is discovered within or adjacent to the project area that has not been addressed within the environmental analysis until an assessment can be made to determine the effects to the species.
WL-2. To maintain hiding cover for big game within forested ecosystems, retain a minimum of 50 percent of the perimeter of natural and created openings along a minimum of 75 percent of the edge of arterial and collector roads, and along at least 50 percent of streams and rivers as described in the forest plan's standard and guideline on page IV-34.
WL-3. To provide for the needs of a wide variety of wildlife, an average of 100 tons per 10 acres of coarse woody debris in the mixed conifer cover type and 50 tons per 10 acres in the ponderosa pine cover type shall be retained following the guidelines outlined in the goshawk amendment to the forest plan, guideline G (USDA 2000e: CC-22) (Also, in accordance with guideline G, to meet the minimum for down logs, down logs will be avoided during prescribed burn activities. Further, avoid actively lighting bitterbrush and sagebrush in the interspace between trees.)
WL-4. If new raptor nests are found within or adjacent to the project area, a 30-acres buffer shall be placed around the nest, and timing restrictions established if the nest area is occupied. Buffer size, timing restrictions, and restrictions of harvest activities will be made on a case-by-case basis taking into consideration site-specific raptor needs and utilizing raptor protection guidelines from the USFWS Field Office for raptor protection (Romin 2005). If goshawk nests are found, the requirements in the Forest Plan are to be followed to protect the species.
WL-5. Within Treatment Unit 7, located within the Hall Creek northern goshawk post-fledgling areas (PFAs), tree densities outside of the group openings will be thinned to 80 sq. ft. of basal area within ponderosa pine cover types and 90 sq. ft. of basal area within mixed conifer cover types. To improve growth and vigor of trees between the group selection openings, individual trees would be removed to a target density of 60 sq. ft. of basal area within ponderosa pine stands and 80 sq. ft. of basal area within mixed conifer stands in areas outside of goshawk post fledgling areas.
WL-6. For goshawk active nest trees, an approximately 500 foot diameter no burning, harvest or salvage treatment buffer would be applied (USDA 2000e). This feature would apply if an existing nest is active or if an unknown active nest is located prior to or during project implementation.

WL-7. Vegetative management treatments in forested areas within post-fledgling areas should retain the following minimum amount and size of down logs and woody debris, distributed over each treated 10 acres to meet the needs of prey species that utilize this habitat (USDA 2000e). This would average 5 logs per acre in mixed conifer sites.

Cover Type	Minimum Down Logs	Minimum Log Size	Minimum Coarse Woody Debris ≥ 3 inch diameter
	(per 10 acres) Down logs take precedence over tons of coarse woody debris	(Diameter <__>Length) If minimum size is not available, retain largest available on the site	(Tons per 10 acres, inclusive of down logs)
Mixed Conifer	50	12 inch<__>8 feet	100
Ponderosa Pine	30	12 inch<__>8 feet	50

WL-8. Maintain a minimum average of 300 snags per 100 acres (greater than 18 inches DBH and 30 feet tall) in mixed conifer and spruce/fir cover types. Maintain an average of 200 snags per 100 acres (greater than 18 inches DBH in ponderosa pine and 8 inches DBH in aspen, and 30 feet tall in ponderosa pine and 15 feet tall in aspen). For this project, non-linear units greater than 20 acres in size shall leave snags marked for retention. A guideline for residual clumps of snags in conifer stands is to leave a 1 acre no cut area for every 20 acres of harvest. In aspen stands, leave 0.25 acre clumps for every 20 acres of treatment. Clump location selection priority would include squirrel middens, low risk windthrow areas, areas that can be defended from broadcast burning, and areas where live alpine fir exists in clumps (USDA 2000e).

WL-9. Forest vegetation manipulation within goshawk post-fledging family areas (PFA) should be designed to maintain or improve the same habitat features as discussed for the goshawk home range (i.e., stand structure, snags, down logs, nest trees important in the life histories of the goshawk and its prey species common to the geographic location), except:

- To avoid impacts to breeding northern goshawks, timing restrictions (March 1 through September 30) will be applied to all activities that occur within a post fledgling area if nests are active or the territory is occupied as outlined in the goshawk amendment to the Forest Plan (USDA 2000e). Affected treatment units include Unit 7 and portions of former FSR 30150.
 - Metal gates will be installed at the junction of FH 17 and FSR 30150, and at the junction of FSR 30150 and FSR 30151 to facilitate seasonal closures.
- Where timber harvest is prescribed to achieve desired forest conditions, plan the transportation system to minimize disturbance to the PFAs. For example, small, permanent skid trails should be used in lieu of roads to minimize disturbance in goshawk PFAs. Variance may occur if it is determined that a combination of new permanent or temporary roads and permanent skid trails would result in less overall disturbance to PFA habitat (USDA 2000e).

Hydrology and Soils

HS-1. Perennial streams, ponds, and groundwater dependent ecosystems (e.g., springs and wet meadows) will have a buffer of 100 feet from the edge of the water body or to the outer edge of the riparian vegetation, whichever is greater, where the following activities will be avoided:

- Servicing, refueling or staging of equipment (within 150 feet of all riparian areas)
- Broadcast or pile burning
- Use of heavy equipment
- Cutting of any deciduous vegetation
- Skidding
- Landings

Activities that would reduce potential groundcover below 80 percent.
HS-2. Intermittent streams will have the following activities avoided: - Slash and burn piles within 50 ft. of the channel - Burning large wood found within the channel that acts as a stabilizer - Depositing cut material into the channel - Use as turn-around areas - Cutting of deciduous vegetation along the edge or within the stream channel - Non-designated crossings with heavy equipment.
HS-3. Uplands and Roads will have the following restrictions and avoidances: - Avoid operating soil disturbing equipment when soil moisture levels are greater than 75 percent field capacity or on slopes greater than 40 percent - Reuse old existing landings where their location is compatible with management objectives and water quality protection - Use old roads for new temporary road locations where the old road location is not contributing to adverse effects to water resources - Use suitable surface drainage and roadway stabilization measures to disconnect the road from the waterbody to avoid or minimize water and sediment from being channeled into surface waters and to dissipate concentrated flows - Avoid temporary road construction on or within 50 feet of unstable slopes - Outsloping of temporary roads would be constructed where possible - A minimum of a 15 foot buffer of no vegetation removal along all roads with cut slopes (temporary or system) should be maintained to the edge of aspen patch cuts or other even-aged management openings. - For decommissioning roads re-establish stable slope contours and surface and subsurface hydrologic pathways to the extent practicable - In areas identified as having a high erosion potential, effective groundcover values equal to or greater than average values that currently exist will be maintained after treatments in order to prevent excessive erosion. - Avoid burning more than 20 percent of Upper Birch Creek – Hall Creek 7FED in any 3 year period of time.
Range
RG-1. Protect range allotment improvements (fences and water developments) during implantation activities.
RG-2. Livestock grazing will continue to be administered through existing range allotment decisions and annual operating instructions to minimize impacts on regeneration and seeding establishment of vegetation. Measures may include livestock management activities such as herding, salt placement, timing of grazing, fencing, and rest. Rest will follow established DNF guidelines. Normally, the Forest requires that burned or treated areas be rested for two full years. Prior to stocking these areas an evaluation is needed to make sure that the rangelands are within 80% of desired effective ground cover values for the site and desirable plant species are established and producing seed. These timeframes may be modified based on documented consensus from an Interdisciplinary Team. Utilization standards are described in the Forest Plan and apply to this project.
Noxious Weeds
NW-1. All ground disturbing equipment will be thoroughly cleaned to remove dirt, mud, and plant materials at an off-forest location prior to being transported to the project area.
NW-2. Disturbed soils will be evaluated to determine whether rehabilitation is needed and, if so, the methods to use. Seed mixes used for rehabilitation purposes will be certified noxious weed free. Seed mixes will include species that germinate rapidly to provide a quick cover of vegetation (the “nurse crop” technique).

NW-3. If used for rehabilitation purposes, only certified noxious weed-free hay, straw, and mulch will be used.
NW-4. Noxious weeds will be controlled on all disturbed areas should they become established in accordance with the Dixie NF Decision Notice for Noxious Weed Management of January 2000 (USDA 2000a).
Fuels and Air Quality
F-1. Prescribed Fire Plans will be developed that are based on the best available science, project objectives and site-specific fuel types and geography. Implementation of prescribed fires will be in accordance with these plans.
F-2. While conducting prescribed fires, Environmental Protection Agency and Utah Department of Environmental Quality air quality standards through compliance with the Utah State Smoke Management Plan will be maintained.
Timber
TM-1. Unmerchantable material may be made available for fuel wood and biomass opportunities if markets exist.
TM-2. During timber sale layout, live trees with visible wildlife use indicated by the presence of nests and/or tree holes will be identified and retained.
TM-3. Timber harvest operations and landings should be located off of Main Canyon Road (FH 17), and should not obstruct traffic flow.
Recreation
REC-1. Cut stumps 6” or less where visible from FH 17 and the Griffin Point Trail.
REC-2. Treat slash from log landings visible from FH 17 and the Griffin Point Trail to maintain the scenic integrity.
REC-3. Mark trees which are visible from FH 17 and the Griffin Point Trail only on the side of the tree facing away from the road or trail.
REC-4. Mark timber sale boundaries which will be visible from FH 17 and the Griffin Point Trail with signs rather than paint.
REC-5. Do not impede traffic on FH 17.

ALTERNATIVE CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

An additional alternative was submitted by a commenter. A comment analysis was conducted on this alternative and issues were separated into two groups: “key” and “non-key.” Key issues were defined as those directly or indirectly caused by implementing the Proposed Action and requiring considering modification of the Proposed Action (Modified Proposed Action, Alternative 2) or the development of a new alternative (Alternative 4). Non-key issues were identified as those: (1) outside the scope of the Proposed Action; (2) already decided by law, regulation, Forest Plan, or other higher level decision; (3) irrelevant to the decision to be made; (4) conjectural and not supported by scientific or factual evidence; (5) general comment, opinion, or position statement; (6) part of the Modified Proposed Action/Purpose and Need; (7) component of the

Environmental Document and/or Project Record; (8) analyzed as part of the No Action Alternative; or (9) does not meet the Purpose and Need. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7: “identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3).” Key issues from this suggested alternative are existing components of Alternative 3. Therefore, this additional alternative was not studied in detail. A list of key and non-key issues and reasons regarding their categorization is located in the Comment Analysis in the project record.

COMPARISON OF ALTERNATIVES

Table 16 provides a summary of the vegetation treatment acres and transportation system miles that would result from implementing each alternative.

Table 16. Comparison of alternatives.

Treatment	No Action	Modified Proposed Action	Alternative 3
Pinyon-juniper Control	No action.	Up to 30 acres of shrublands would have encroaching pinyon pine and juniper removed	Same as Modified Proposed Action
Ponderosa and Mixed Conifer Group Selection	No action.	Treat about 647 acres of ponderosa pine stands and 124 acres of mixed conifer stands for a total of 771 acres with a group selection regeneration harvest.	About 312 acres of ponderosa pine stands and 140 acres of mixed conifer stands would be treated with a group selection regeneration harvest. A total of 452 acres would be treated.
Artificial Reforestation	No action.	Reforestation of 108 acres of ponderosa stand preceded by understory site preparation using prescribed fire and/or mowing.	Same reforestation as the Modified Proposed Action (108 acres), but site preparation would be limited to grubbing (i.e., no prescribed fire and/or mowing).
Ponderosa Pine Stand Improvement	No action.	Pre-commercial thinning on 201 acres.	No action.
Wildland Urban Interface Treatment	No action.	Shaded fuel breaks created on an estimated 395 acres adjacent to private lands.	Same as Modified Proposed Action except no treatment occurs in Dixie NF draft UR/UD areas, for a total of 151 acres treated.
Update to Transportation Plan	No change.	1.92 miles of temporary roads established to facilitate vegetation treatments. 6.3 miles of road (former FSR 30150 and former FSR 30538) added to the Forest Road System and 4.02 miles of FSR 30150 closed during goshawk nesting season. FSR 30151 changed from open road to motorized trail. The result would be a net gain of 2.03 miles of system roads and 4.27 miles of motorized trail.	No temporary roads established to facilitate vegetation treatment. Former FSR 30150 classified as administrative access only. Former FSR 30538 will remain closed. Route 30151 closed after project completed. The result would be a net gain of 1.24 miles of system road and 0.79 of non-motorized trail.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above.

VEGETATION RESOURCE

Introduction

This section presents a summary of the Silviculture and Climate Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Silviculture and Climate Report, contained in the project record. Included in this section are a summary of the affected environment and a summary of the environmental consequences of each of the three alternative actions described in Chapter 2.

As described in Chapter 1 on pages 5 and 6 of the Silviculture and Climate Specialist Report under the heading of Shrublands, 30 acres of natural meadows within forest stands are being encroached by conifers. These 30 acres are incorporated into the vegetation resource analysis as a timber stand improvement or tree control thinning and the environmental consequences discussion below includes these 30 acres within the total acres treated. For a detailed analysis of the tree control activity, refer to the effects analysis beginning on page 22 of the Silviculture and Climate Specialist Report.

Affected Environment

The Mitchell Spring Vegetation Improvement Project area is located within Garfield County, Utah; approximately 13 miles northwest of the City of Escalante. The project area encompasses the upper reaches of the Birch Creek watershed. Elevation varies from 6,920 feet to 9,360 feet. At lower elevations the vegetation is a sagebrush shrubland and riparian drainages. As elevations rise from the valley bottom, the vegetation transitions first to pinyon pine-juniper woodlands, then to ponderosa pine, and finally, along the upper slopes, to mixed conifer and spruce-fir forests.

The project area has a long history of timber management. Since 1960 over 11,000 acres within and surrounding the project area has received silviculture treatments such as timber, harvest, thinning, and reforestation. Following the last timber harvest conducted in the early 1990s tree densities and species composition have changed over time so that they are not within the desired condition now. High tree densities can limit growth and vigor, increasing the potential of tree mortality from insects, disease, and crown fire. The project area also lacks diversity in age or size classes of trees. Most forest stands consist of trees ranging from 5-16 inches in diameter with larger and smaller size classes lacking. A forest with a range of tree age or size classes across the landscape are more resilient to disturbances and provide better for wildlife habitat than forests that are homogeneous (Arno and Harrington 1995).

Please refer to Chapter 1 for the existing and desired conditions for the vegetation resources.

Environmental Consequences

The analysis of the environmental consequences considers the effects of three alternatives proposed to meet the purpose and needs identified within the Mitchell Spring Project. Alternative 1, the No Action Alternative, provides a basis for comparing the action alternatives to what would occur if an action alternative is not chosen. Alternative 2, the Modified Proposed Action, and Alternative 3, propose various actions to meet the purpose and need for the project.

Alternative 1 (No Action)

Direct and Indirect Effects

With no action, treatments within the project area to thin and regenerate forests for the purpose of diversifying tree and age class structure would not occur. Currently conifer stand structures are dominated by a young and mid-aged forest (Vegetation Structural Stage, VSS 3-4). Modeling shows that trees will continue to grow into the larger size classes but at a slower rate due to a lack of vigor from high tree densities. Little recruitment within the younger size classes will happen unless a disturbance such as an insect epidemic or stand replacing wildfire occurs. As successional processes continue in the undisturbed forest stands, canopies will close, favoring shade tolerant conifers such as white fir or juniper in the understory and overstory. A likely result over the long term (50 to 100 years) of these successional processes will be a forest type conversion to climax cover types such as white fir (Youngblood and Mauk 1985). Conditions such as these will not meet the desired conditions of mixed conifer and ponderosa pine cover types as described in the Dixie National Forest Land and Resource Management Plan (Forest Plan) and assessments nor the project purpose and need.

With no action, forest products such as saw timber would not be available to meet the Forest Plan's allowable sale quantity goal or for the economic benefit of local communities. Based on the current and expected future conditions, without action, risk of severe fire behavior within forests, woodlands, and the wildland urban interface will increase over time. With no action, stands with old growth characteristics would not change and will still consist of 35 percent of forest and woodlands within the Birch Creek drainage. With Alternative 1, no changes will be made to the Forest's system of roads. There will be no loss of productive forest land due to conversion to a non-forest use.

Cumulative Effects

The Cumulative Effects Area (CEA) for the vegetation resource is the Birch Creek (#140700050102) 6th field HUC watershed. This area encompasses a total of 29,258 acres, of which 25,075 is administered by the Dixie National Forest.

The cumulative effects area for the effects of transportation changes to vegetation resources is the combined watersheds of Birch Creek and Upper North Creek. This area encompasses a total of 58,851 acres and includes the areas of proposed road changes.

Known commercial harvesting, thinning, and improvement cuttings designed to promote the retention of desired species, diversify age structure, and maintain growth and vigor are occurring or are planned on approximately 2,009 acres or about 7 percent of the cumulative effects area.

Alternative 1 would treat no additional acres to meet forest plan vegetation objectives.

Alternative 1 would contribute no additional acres towards forest plan objectives to improve forest and woodland resilience to agents of disturbance such as large scale insect outbreaks or severe wildfire behavior. Alternative 1 would not provide for increased diversity of vegetation patterns across the landscape for the benefit of vegetation resiliency and wildlife habitat. With current management direction, the existing 150 acres of roads affecting productive forest land within the analysis area would not change.

Alternative 2 (Modified Proposed Action)

Direct and Indirect Effects

Under Alternative 2, the Modified Proposed Action, 1,080 acres of forest stands would be treated to diversify forest structure. The treatments, consisting of thinning, reforestation, and small groups for natural regeneration would increase both the younger (VSS 1&2) and older (VSS 5&6) size classes at the expense of the VSS 3 and 4 size classes. Northern goshawk nest areas would receive a light thinning of the understory and overstory down to a minimum of 80 sq. ft. of basal area in ponderosa pine and 90 sq. ft. of basal area in mixed conifer. Post-fledgling areas would receive the same thinning along with small group cuts to maintain existing canopy cover while allowing for a more balanced size class distribution.

With this Alternative 1,110 acres are proposed to not only diversify forest structure, but to reduce tree densities, regenerate seral tree species such as ponderosa pine, and improve species composition. These acres, along with the proposed wildland urban interface treatments, will reduce potential wildfire behavior in the project area. These same treatments will improve vegetation conditions to allow for more resilience to agents of disturbance such as wildfire or insect outbreaks.

With Alternative 2, about 296 acres of stands with old growth characteristics would be treated to diversify size class, improve species composition, and reduce tree densities. These treatments are proposed to reduce fire risk and improve forest resilience to disturbances. Following treatments old growth will be reduced by 1 percent to a total of 34 percent of forest and woodlands within the Birch Creek drainage. Alternative 2 proposes to provide a volume of 9,789 CCF (centum or 100 cubic feet) of saw timber to meet forest plan allowable sale quantity goals for the benefit of local economies.

Alternative 2 proposes to add 6.30 miles of roads to the transportation system. The roads will improve long term access to forest stands within the project area for vegetation management. With the use of the proposed system and temporary roads, skidding distances within harvest units are expected to average 492 feet.

Cumulative Effects

Known commercial harvesting, thinning, and improvement cuttings designed to promote the retention of desired species, diversify age structure, and maintain growth and vigor are occurring

or are planned on approximately 2,009 acres or about 7 percent of the cumulative effects area (CEA). Alternative 2's treatments would total 3,118 acres or 11 percent of the analysis area.

Management actions designed to improve forest health and reduce forest fuels are planned or are occurring on approximately 2,009 acres within the CEA. Alternative 2 would contribute an additional 1,505 acres. Current and future projects to diversify vegetation patterns across the landscape have occurred on about 7 percent of the CEA. Alternative 2 will treat an additional 5 percent of the CEA. Alternative 2 will help provide more diverse landscapes in tree size classes for the benefit of wildlife habitat and forest resiliency.

There are about 114 miles of existing road miles within the transportation cumulative effects area. Converting this road mileage to acres provides an estimate of 149 acres of forest land converted to a non-forest use as roads. In addition, there is 1 acre of gravel pits. Total of roads and pits is 150 acres of forest land converted to a non-forest use. In other terms, road conversion has affected 0.25 percent of forest land within the transportation CEA. Alternative 2 provides a road system effecting 0.27 percent of forest land

Alternative 3

Direct and Indirect Effects

Under Alternative 3, 560 acres of forest stands would be treated to diversify forest structure. The treatments, consisting of thinning, reforestation, and small patches for natural regeneration would increase both the younger and older size classes at the expense of the VSS 3 and 4 size classes. This alternative removes goshawk nest areas and the unroaded/undeveloped area from treatment; the acres not treated would have similar effects as Alternative 1 on VSS distribution.

With this alternative only 590 acres are proposed to diversify forest structure, reduce tree densities, regenerate seral tree species (such as ponderosa pine), and improve species composition. These acres, along with the proposed wildland urban interface treatments, will reduce potential wildfire behavior in the project area but to a lesser scale than Alternative 2. These same treatments will improve vegetation conditions to allow for more resilience to agents of disturbance such as climate change, wildfire, or insect outbreaks.

With Alternative 3, about 32 acres of stands with old growth characteristics would be treated to diversify age class, improve species composition, and reduce tree densities. These treatments are proposed to reduce fire risk and improve forest resilience to disturbances. Following treatments old growth will still consist of 35 percent of forest and woodlands within the Birch Creek drainage. Alternative 3 proposes to provide a volume of 5,262 CCF of saw timber to meet forest plan allowable sale quantity goals for the benefit of local economies.

Alternative 3 proposes to add a net total of 1.24 miles of roads to the transportation system. The roads will improve long term access to forest stands within the project area for vegetation management, but not as well as Alternative 2. Without the use of temporary roads, skidding distances within harvest units would average 1,060 feet and would treat 319 fewer acres. There will be a loss of about 3 acres of productive forest land due to conversion to a non-forest use as roads or trails.

Cumulative Effects

Known commercial harvesting, thinning and improvement cuttings designed to promote the retention of desired species, diversify age structure, and maintain growth and vigor are occurring or are planned on approximately 2,009 acres or about 7 percent of the cumulative effects area (CEA). Alternative 3's treatments along with other current or planned activities would total 3,118 acres or 9 percent of the analysis area.

Management actions designed to improve forest health and reduce forest fuels are planned or are occurring on approximately 2,009 acres within the CEA. Alternative 3 would contribute an additional 741 acres. Current and future projects to diversify vegetation patterns across the landscape have occurred on 7 percent of the CEA. Alternative 3 will treat an additional 2 percent of the CEA. Alternative 3 will help provide more diverse landscapes in tree size classes for the benefit of wildlife habitat and forest resiliency but less than those proposed with Alternative 2.

Alternative 3 provides a road system affecting 0.26 percent of forest land within the CEA which is less than Alternative 2 and about the same as Alternative 1.

Summary of Effects to Vegetation Resources

Table 17. Summary of effects for vegetation resources by alternative.

Purpose and Need or Issue	Measure	Alternative 1	Alternative 2	Alternative 3
Forest Vegetation Structural Stage	Acres treated to encourage desired VSS diversity	0	1,080	560
Desired Vegetation Conditions	Acres treated to encourage desired vegetation conditions	0	1,110	590
Forest Products Offered	Use silvicultural activities to provide commercial wood products	0	9,789 CCF	5,262 CCF
Fire Risk	Acres treated to reduce fire risk	0	1,505	633
Wildland Urban Interface	Acres treated to improve the WUI	0	395	151
Productive Forest Land	Acres of productive forestland converted to non-forest use	0	9	3
Old Growth	Acres of old growth converted to other forest or woodland age class	0	296	32

Table 18. Cumulative effects to vegetation resource by acres and percent of area.

Category	Present and Future	Alternative 1	Alternative 2	Alternative 3
Acres treated to encourage desired VSS diversity	2,009	2,009	3,118	2,599
Acres treated to encourage desired vegetation conditions	2,009	2,009	3,118	2,599
Use silvicultural activities to provide commercial wood products (CCF)	7,960 CCF	7,960 CCF	17,749 CCF	13,221 CCF
Acres treated to reduce fire risk	2,009	2,009	3,514	2,749
Acres treated to improve the WUI	0	0	395	151
Acres of productive forestland converted to non-forest use	160	160	160	152
Percent of road acres within forest land in CEA	0.27%	0.27%	0.27%	0.26%
Acres of old growth converted to other forest or woodland age class	408	408	704	440

CLIMATE

Alternative 1 (No Action)

Direct, Indirect, and Cumulative Effects

Climate Change Influences on Vegetation Resiliency

Climate Change and Insect Disturbance—Climate can have direct effects on insect metabolism and lifecycles and can indirectly affect “factors such as food quality and predation” (Bentz et al. 2008). Although future climate change at the local level is uncertain, a shift towards a drier or seasonally drier condition could result in an increasing risk over time of large-scale insect attack in the absence of management action to control tree stocking levels. Increased tree densities result in increased inter-tree competition for limited water and nutrients. Increased moisture stress reduces the natural defenses of the tree to repel insect attack and makes the forest susceptible to large-scale loss during periods of extended drought. An example is the recent spruce bark beetle epidemic that occurred on the Dixie NF over the last two decades resulting in high mortality of Engelmann spruce on Cedar Mountain and the Aquarius Plateau (Samman and Logan 2000: 28; UDNR 2003). Regionally, a complex of droughts and insects has caused widespread mortality in the pinyon and juniper woodlands since at least 1990 (Shaw 2006; Witt and Shaw 2010).

Climate Change and Vegetation Resiliency—With Alternative 1, an opportunity to manage forests and woodlands within the project area towards desired conditions would not occur. Stand densities would continue to increase and forest fuels would continue to accumulate. There would

be an increasing risk of severe wildfire with the potential for catastrophic carbon losses to the atmosphere. There would be continued releases of carbon to the atmosphere from the decomposition of down dead wood, especially in areas that are currently experiencing high levels of conifer mortality from insect attacks and fire. Conifer mortality would increase over time as species composition changes, stocking levels increase, and forest stands become more susceptible to attack by insects and disease. Conifer mortality leads to additional amounts of fuels and decomposing woody material. Forest stands containing a lack of vigor or diversity may have their ability to adapt to meet future climate challenges compromised.

Climate Change and Wildfire Severity—Climate warming associated with elevated greenhouse-gas (GHG) concentrations may create an atmospheric and fuel environment that is more conducive to large severe fires. General circulation model studies suggest that fire occurrence or area burned could increase across North America under a doubled CO₂ environment because of increases in lightning activity, the frequency of surface pressure and associated circulation patterns conducive to surface drying, and fire-weather conditions in general that are conducive to larger and more severe wildfires (Chambers 2008: 30; McKenzie et al. 2011; Ziska et al. 2005). With no action, forest and woodlands within the project area would not be as resilient to disturbances such as wildfire under a changing climate.

Climate Change and Adaptation—Under some predictive scenarios, changes in climate may occur that will exceed the capacity of existing forest and woodland vegetation to adjust physiologically and developmentally. Furthermore, climate changes may occur at rates that will exceed the capacities of forest species to evolve in place to adapt to new conditions or to migrate to more favorable, future environments. Being relatively long lived, the forest trees living today will probably compose much of the forests of the next century. Long term adaptation to climate changes will require healthy and productive forests and woodlands in the short term (Anderson 2008). The susceptibility and resilience of these forests to fire or pest disturbances, as well as their ability to adapt to meet future climate challenges, may be compromised by a lack of vigor or diversity. Declines in vigor may make forests and woodlands more susceptible to large scale pest attacks and more frequent or severe fires. Furthermore, existing plant species or genotypes may be poorly adapted to future climate conditions during all or various parts of their life cycles, resulting in increased risk of regeneration failures and altered trajectories of forest growth, development, and productivity (Anderson 2008; Chambers 2008).

Project Level Carbon Cycling Influences on Climate Change—With no action there would be no immediate change in the amount of sequestered carbon in forest stands and no immediate change in the rate of carbon removal from the atmosphere. The total accumulation of carbon in fully stocked forest and woodland stands will continue to rise until the stands reaches maturity. At some point, the rate of carbon storage declines due to less efficient photosynthesis and higher respiratory losses and may eventually have zero net CO₂ intake (Mader 2007). There would be no removal of wood or fiber for carbon storage in wood product form. There would be no potential use of wood as bioenergy to displace fossil fuel consumption. Since there would be no silvicultural activities, emissions from mechanical equipment would not contribute to atmospheric carbon. There would be no releases of carbon to the atmosphere from prescribed burning.

Alternative 2 (Modified Proposed Action) and Alternative 3**Direct, Indirect, and Cumulative Effects****Climate Change Influences on Vegetation Resiliency**

Although future climate change at the local level is uncertain, both the Mitchell Spring Project's Alternative 2 and 3 along with other past, current, and foreseeable silvicultural treatments within the cumulative effects area would improve the ability of the forest to withstand the forecasted drier or seasonally drier conditions associated with climate change. Resilience to climate change can be accomplished within treated forest and woodland stands by maintaining desired conditions through reducing high tree densities and by favoring drought resistant and more ecologically sustainable species. Thinned forest stands through commercial and non-commercial thinning would be expected to increase vigor in the remaining trees due to reduced competition. Such measures would also reduce the risk of insect attack during prolonged drought periods. If the local climate shifts toward wetter conditions, the measures proposed with both Alternative 2 and 3 would not have a detrimental effect. Severe fire risk is reduced with both Alternative 2 and 3 by reducing densities of standing trees and treating fuels by removal of merchantable material and biomass, and prescribed fire (Graham et al. 1999).

Project Level Carbon Cycling Influences on Climate Change

Both Alternative 2 and 3 would result in an immediate reduction in the capacity of the standing forest to store carbon due to the reduction in the number of trees. However much of the carbon stored in the harvested trees will remain sequestered in the resulting manufactured forest products and eventually released to the atmosphere over a long period (Smith et al. 2006: 1).

Both of the action alternatives' harvest and thinning treatments will temporarily reduce canopy cover, maintain stand vigor, capture mortality, and shift carbon uptake to more efficient growers. The group selection and reforestation treatments are designed to regenerate or create new size classes of seedling and saplings. Regeneration within these areas will re-establish or maintain fully stocked, young, vigorous stands. "While these treatments may release carbon in the short term, they focus growth and storage for the future on trees that are at lower risk and/or more resilient to disturbance" (USDA 2015a).

Both action alternatives will reduce the risk of losing relatively large volumes of carbon to the atmosphere as a result of major wildfire in the project area. Following the treatments of either action alternative, fire behavior under severe wildfire conditions will decrease. Flame lengths will be lower and there will be a reduced chance for fire to climb into the crowns. The result will be post project conditions where wildfires would be less damaging and easier to suppress (Graham et al. 1999). Accumulations of snags and down dead wood release carbon to the atmosphere through decomposition. Prescribed fire following harvest and thinning activities will minimize the accumulation of activity generated slash. The project would result in short term releases of carbon to the atmosphere during prescribed fire activities. Although prescribed burning returns some carbon, other GHG, and particulate matter to the atmosphere, combustion is more complete than wildfire, which releases higher concentrations of the other GHG and particulate matter (Mader 2007). There will be short term emissions associated with machinery while harvest activities are underway. With up to 1,505 treated acres, depending on alternative,

the Mitchell Spring Project activities represent only a small percentage (0.0003 percent) of forest and woodlands in Utah. The potential for utilization of biomass for bioenergy would also have the potential to displace some fossil fuel consumption.

Monitoring Recommendations

With both action alternatives 2 and 3, areas proposed for harvest under selection cutting can be regenerated using standard reforestation techniques. The reforestation technique and range of desired stocking will be documented in a formal silvicultural prescription. Natural regeneration sites will be monitored by the implementation silviculturist to ensure the areas meet the prescribed post treatment stocking. If the areas do not meet desired stocking after 5 years, conditions that are inhibiting regeneration will be identified and remedial action may be prescribed to ensure regeneration.

Implementation monitoring of tree removal and thinning will be conducted by a timber sale administrator and contract inspectors. Inspectors will be expected to follow procedures outlined in FSH 2409.17_6.4.

WILDLIFE AND FISHERIES RESOURCE

Introduction

This section presents a summary of the Wildlife and Fisheries Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Wildlife and Fisheries Specialist Report, contained in the project record. Included in this section are a summary of the affected environment and a summary of the environmental consequences of each of the three alternative actions described in Chapter 2.

Affected Environment

The cumulative effects area (CEA) for most wildlife species in the Mitchell Spring Vegetation Improvement Project Area is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. The CEA represents a landscape surrounding the Project Area where past, present, and future management actions by humans have and/or will occur, with special reference to past and ongoing vegetation treatments, livestock grazing, recreation use, motorized road access, fire suppression, and future vegetation management projects.

The wildlife species discussed in this document use all or parts of these areas within the Forest boundary. Analysis for wide ranging species like big game (mule deer, Rocky Mountain elk) involves a different CEA that is based on Utah State Division of Wildlife Resources (UDWR) management strategies. The CEA for big game (mule deer and elk) is the portion of the Plateau and Boulder/Kaiparowitz Herd Management Areas (units #25C/26) that fall within the Posey Lake, Osiris, and Upper Valley Motorized Travel Plan (MTP) Implementation Areas (IA) encompassing approximately 153,122 acres.

The Cumulative Effects Area (CEA) for aquatic biota includes two 6th field HUC watersheds: Birch Creek (140700050102) and Upper North Creek (140700050103). This area encompasses a

total of 58,851 acres, of which 55,022 acres are upstream of the National Forest boundary on the Escalante Ranger District (Table 19). A small portion of the Sweetwater Creek 6th field HUC (160300020403) watershed is within the project boundary; however, no treatments are proposed and no effects would be expected to waters within that watershed. The Sweetwater Creek watershed will not be considered any further in this analysis.

Perennial streams within the proposed project area include: Birch Creek, Hall Creek, Water Canyon Creek, Spencer Canyon, and an unnamed tributary to Birch Creek. Downstream receiving waters potentially affected by the proposed project include Birch Creek, North Creek, and the Escalante River. Past, present and reasonably foreseeable management activities potentially affecting aquatic biota within the CEA include: timber harvest and vegetation management, livestock grazing, agriculture, wildfire, prescribed fire, recreation, motorized vehicle use, exclosure construction and maintenance, water diversion and use, nonnative fish stocking, and native cutthroat trout restoration activities. A complete list of past, present and reasonably foreseeable management activities within the CEA is presented below.

Terrestrial and Aquatic Wildlife and Plant Resources

Wildlife species selected for this analysis include: (a) species that are listed as Threatened, Endangered, or Proposed under the Endangered Species Act (USFWS 2013), (b) Sensitive Species listed on the Regional Forester's Sensitive Species List (USDA 2013c), (c) Management Indicator Species as designated by the Dixie National Forest Land Resource Management Plan (USDA 1986), and (d) Other Species of Concern (Table 19).

Plant Species selected for this analysis include: (a) species that are listed as Threatened, Endangered, or Proposed under the Endangered Species Act (USFWS 2013) and (b) Sensitive Species listed on the Regional Forester's Sensitive Species List (USDA 2013c) (Table 20).

Table 19. Habitat suitability for Threatened, Endangered, Sensitive, Management Indicator, and Other Wildlife Species of Concern for the Mitchell Spring Vegetation Project, Escalante Ranger District, Dixie National Forest.

SPECIES (Common Name)	No detailed discussion and analysis is necessary for species or habitat not present within the affected area. Rationale for no further analysis of these species can be found in Appendix B of the Wildlife and Plant Resources Specialist Report.	Supporting rationale is presented in this section for those species or habitats known to be present but not necessarily affected by the proposed actions. No detailed discussion / analyses are necessary.	Species considered present and potentially affected by the proposed actions are carried forward into a detailed discussion and analysis in the Environmental Consequences Section.
Threatened & Endangered Species			
Mexican Spotted Owl (T) ^a			+
California Condor (E) ^e			+
Utah Prairie Dog (T) ^b	+		
Western Yellow-billed Cuckoo (T)	+		
Intermountain Regional Forester's Sensitive Species			
American Peregrine Falcon ^b			+
Bald Eagle ^a		+	
Flammulated Owl			+
Greater Sage-grouse ^c	+		
Northern Goshawk ^c			+
Pygmy Rabbit	+		
Spotted Bat ^c			+
Townsend's Big-eared Bat ^c			+
Three-toed Woodpecker ^c		+	
Desert Bighorn Sheep		+	
Bonneville cutthroat trout	+		
Colorado River cutthroat trout			+
Southern leatherside chub	+		
Boreal toad		+	
Dixie National Forest Management Indicator Species (MIS)			
Rocky Mountain Elk			+
Mule Deer			+
Northern Flicker			+
Wild Turkey			+
Nonnative Trout			+
Virgin Spinedace	+		
Other Species of Concern			
Lewis's Woodpecker			+
Virginia's Warbler			+
Black-throated Gray Warbler			+
Gray Vireo			+
Broad-tailed Hummingbird			+
^a State of Utah Threatened Species ^c State of Utah Species with special concern due to substantial decrease in population, distribution, or habitat availability OR limited distribution or specialized habitat use. ^b State of Utah Endangered Species ^d Candidate for Federal Listing ^e Experimental Population ^f Proposed for Federal Listing 			

Table 20. Habitat Suitability for Threatened, Endangered and Sensitive plant species found on the Escalante Ranger District. This list is derived from those species that are known-or-suspected to occur on the Escalante Ranger District (Madsen 2011; USDA 2013c).

SPECIES Common name Scientific name	No detailed discussion and analysis is necessary for species or habitat not present or not impacted within the affected area. The rationale for no further analysis for these species can be found in Appendix B of the Wildlife and Plant Resources Specialist Report.	Species considered present and potentially affected by the proposed actions are carried forward into a detailed discussion and analysis in Environmental Consequences Section.
Threatened, Endangered and Sensitive Plants-Escalante Ranger District		
Reveal paintbrush (<i>Castilleja parvula</i> var. <i>revealii</i>)	+	
Yellow-white cryptanth (<i>Cryptantha ochroleuca</i>)	+	
Widtsoe buckwheat (<i>Eriogonum aretoides</i>)	+	
Jones goldenaster (<i>Heterotheca jonesii</i>)	+	
Cedar Breaks Biscuitroot (<i>Cymopterus minimus</i>)	+	
Neese pepperplant (<i>Lepidium montanum</i> var. <i>neeseae</i>)	+	
Platy penstemon (<i>Penstemon bracteatus</i>)	+	
Aquarius penstemon (<i>Penstemon parvus</i>)	+	
Podunk groundsel (<i>Senecio malmstenii</i>)	+	
Maguire campion (<i>Silene petersonii</i>)	+	
Rock-tansy (<i>Sphaeromeria capitata</i>)	+	
Species that have no habitat will not be impacted within the project area (column 1) and would not be affected by this project in any way (See Appendix B – Rationale for species not included.)		

Environmental Consequences

The analysis of the environmental consequences considers the effects of three alternatives proposed to meet the purpose and needs identified within the Mitchell Spring Project. Alternative 1, the No Action Alternative, provides a basis for comparing the action alternatives to what would occur if an action alternative is not chosen. Alternative 2, the Modified Proposed Action, and Alternative 3 propose various actions to meet the purpose and need for the project.

Alternative 1 (No Action)**Direct and Indirect Effects**

Maintaining the Project Area in its existing condition would preclude any vegetation treatment. The habitat conditions described in the affected environment section would continue in the short term. In the long term, VSS conditions will continue to be dominated by VSS 3 stands and eventually these stands will move into VSS 4 structure class but over a much greater time period and would also leave these stands overstocked leading to competition for resources and a greater likelihood of insect infestation or loss due to catastrophic wildfire.

Under the No Action Alternative, current down woody debris levels would remain low and may increase as trees fall across the project area over time. Snags would continue to be underrepresented in the ponderosa pine type across the project area.

THREATENED AND ENDANGERED WILDLIFE SPECIES**Mexican Spotted Owl**

Vegetation treatments within juvenile dispersal and winter foraging habitat would not occur. Dispersal habitat would be maintained at its current state, with a slow increase of down wood over time.

California Condor

Vegetation treatment within foraging habitat would not occur. Foraging habitat would be maintained at its current state, with a slow increase of down wood over time.

SENSITIVE WILDLIFE SPECIES

American Peregrine Falcon. Vegetation treatments on potential foraging habitat would not occur. Foraging habitat would be maintained in its current state in the short term.

Flammulated Owl. Vegetation treatments within potential foraging/nesting habitat would not occur. Foraging/nesting habitat would be maintained at current levels over the short-term.

Northern Goshawk. Nesting and foraging habitat would continue to be limited and/or outside the desired range of vegetation structural stages (VSS) classes. These conditions would eventually improve over the long-term as naturally regenerated ponderosa pine and mixed conifer stands mature but over a much longer period than with the Modified Proposed Action or partially with Alternative 3. Vegetation treatments within potential foraging and nesting habitat would not occur. The existing goshawk habitat would be maintained at current levels over the short-term. Existing goshawk habitat still falls within the range of variability to be considered suitable.

Spotted Bat and Townsend's Big-eared Bat. Vegetation treatments within potential foraging habitat would not occur. Foraging habitat would be maintained at current levels over the short-term.

Colorado River Cutthroat Trout (CRCT). Under the No Action Alternative vegetation within the project area would not undergo any treatments. Forage conditions for livestock and wildlife and desirable forest conditions would not be maintained or improved and the risk of risk of severe fire behavior within the WUI area would remain.

No direct or indirect effects to CRCT or their habitat are expected from implementation of Alternative 1. Sediment effects from the current transportation system, as discussed in the Hydrology and Soils Specialist Reports would remain.

Boreal Toad. Under the No Action Alternative vegetation within the project area would not undergo any treatments. Forage conditions for livestock and wildlife and desirable forest conditions would not be maintained or improved and the risk of risk of severe fire behavior within the WUI area would remain.

No direct or indirect effects to boreal toad or aquatic habitat are expected from implementation of Alternative 1. Sediment effects from the current transportation system, as discussed in the Hydrology and Soils Specialist Reports would remain.

WILDLIFE MANAGEMENT INDICATOR SPECIES

Mule Deer and Rocky Mountain Elk. Vegetation treatments on potential foraging, hiding cover, fawning, or calving habitat would not occur. Foraging, cover, calving and fawning habitat would be maintained at current levels. Road densities will not change. Summer and winter habitats for deer and elk will not change.

Northern Flicker. Vegetation treatments on potential nesting/foraging habitat would not occur. These habitats would be maintained at current levels over the short-term. In the long term, availability of nesting habitat would fluctuate as beetle populations go through normal increases or declines due to host availability.

Wild Turkey. Vegetation treatments on potential nesting/foraging and/or roosting habitat would not occur. These habitats would be maintained at current levels over the short-term. Roosting habitat would remain static over the long-term. Nesting and foraging habitat would remain in the same condition as well.

Nonnative Trout. Under the No Action Alternative the 1.5 miles of route 30150 and 0.8 miles of route 30538 would not be reclassified and would remain closed under the Dixie MTP. Under the existing condition these routes all have existing road beds and receive unauthorized use by the public. Within the Upper North Creek watershed these routes do not cross or come within 100 feet of any aquatic resources. No direct or indirect effects to fish or aquatic habitat are expected within the Upper North Creek Watershed from implementation of Alternative 1.

OTHER SPECIES OF CONCERN

Lewis's Woodpecker. Vegetation treatments in potential nesting and foraging would not occur. Nesting and foraging habitat would be maintained at the current levels in the short term, and no nesting birds, including Lewis's Woodpecker would be disturbed.

Virginia's Warbler. Vegetation treatments in potential nesting and foraging would not occur. Nesting and foraging habitat would be maintained at the current levels in the short term, and no nesting birds, including Virginia's warbler, would be disturbed.

Black-throated Gray Warbler. Vegetation treatments in potential nesting and foraging would not occur. Nesting and foraging habitat would be maintained at the current levels in the short term, and no nesting birds, including Black-throated Gray Warbler, would be disturbed.

Gray Vireo. Vegetation treatments in potential nesting and foraging would not occur. Nesting and foraging habitat would be maintained at the current levels in the short term, and no nesting birds, including Gray Vireo, would be disturbed.

Broad-tailed Hummingbird. Vegetation treatments in potential nesting and foraging would not occur. Nesting and foraging habitat would be maintained at the current levels in the short term, and no nesting birds, including broad-tailed hummingbirds, would be disturbed.

Cumulative Effects

Since there would be no direct or indirect effects to any species expected from the No Action Alternative and ongoing impacts are considered to be the environmental baseline, there could be no cumulative effects associated with this alternative.

Alternative 2 (Modified Proposed Action)

Direct and Indirect Effects

The timing and duration of the Modified Proposed Action would be as follows: (1) WUI fuels work and conifer thinning in shrublands could begin as early as fall 2015 and (2) timber sales would not likely occur until 2016 at the earliest. In general, project activities may remain active for up to 5 years post decision or longer depending on contract extensions and delays.

In general, there is a potential for short-term direct disturbance to wildlife if project activities were to occur between April and October. If activities were to occur between November and March, only the Mexican spotted owl has potential to be impacted since they are the only species that may be present during the winter months. In addition, mechanical logging, machine piling, pile burning, and brush hog mulching work would produce noise and smoke in the area. The presence of people, fire, and smoke would disturb wildlife in the immediate vicinity during the spring and fall months. Most species selected for analysis could have a presence in the area during the spring and/or fall months and would likely be found there during the summer months.

For this analysis, short term is defined as effects occurring during implementation and up to five years afterwards. Long-term effects are defined as occurring five years and more after implementation of treatments is complete.

For aquatic wildlife, direct effects are impacts that result in the direct mortality of a fish. One example would be a water quality impact such as a major chemical spill. Another example would be equipment in a creek that directly crushes and kills trout eggs incubating in the gravel.

Indirect effects are impacts that are not directly connected in space and time. One example would be the spread of an aquatic nuisance species that changes the ecology of an aquatic habitat, indirectly reducing the habitat quality for a native species. Another example would be sediment from a disturbance that embeds gravels, reducing spawning success and decreasing aquatic macroinvertebrate food production.

THREATENED AND ENDANGERED WILDLIFE SPECIES

Mexican Spotted Owl

In general, short-term (i.e., < 5 years) impacts to dispersing/wintering Mexican spotted owl habitat may occur with implementation of the proposed project. Group selection timber harvest, pinyon and juniper control, ponderosa pine improvement, cottonwood and willow improvement, WUI treatments, and reforestation activities would occur during the day and would not directly affect this nocturnal species. However, burning activity fuels piles might extend into the evening hours and create a short term disturbance to the incidental use of the area by owls. This direct impact is expected to be minimal due to the lack of documented use of the area and the available dispersal habitat adjacent to the project area that will not be impacted. It is within dispersal distance from known breeding/roosting habitat however, dispersing owls typically move to lower elevations up to 50 km from breeding/roosting habitat (Willey and Ward 2003). Also, there is no critical habitat or Protected Activity Center (PAC) within the project or CEA area.

Wintering/juvenile dispersal habitat components affected by project implementation include ground cover, large diameter trees, snags, and downed logs. In general, large diameter trees would decrease across the landscape which is a long-term effect on habitat. Snags are not currently meeting desired condition in the ponderosa pine type but large green trees will be left to aid in future snag recruitment. Down woody debris would increase as activity fuels accumulate, and ground cover would increase as more light hits the forest floor. Timber harvest with related impacts (large diameter tree loss, possible inadvertent or hazardous snag loss, increased down woody debris) would occur on up to 1,395 acres of the 4,313 acre project area in mixed conifer and ponderosa pine. This represents a change in habitat condition on approximately 32 percent of the project area. Other treatments such as the WUI and ponderosa pine improvement and pinyon-juniper control will also remove overstory trees but snags are not targeted. Removal of overstory trees could cause owls to use the habitat differently with the loss of perch trees since they are short perch and fly foragers. This impact is minimal due to the fact that plenty of perch trees will remain on the landscape.

Canopy cover, forested edge and openings, ground cover, and retention of large diameter trees are interrelated. As canopy cover reduces, more openings are created, changing or increasing edge and increasing light to the forest floor, which generally increases the quantity and diversity of ground cover. For this project, canopy cover would be reduced slightly in areas that are treated to create WUI to control pinyon and juniper trees, or are thinned, and it would be lost in areas that are patch clear cut. These clear cut areas are small 1-2 acre patch cuts spread out over the whole 771 acre group selection area. Harvest activities are not expected to impact current snag levels and prescriptions will provide for future snag recruitment from large diameter trees that will not be cut. In general, these conditions create better small mammal and bird habitat, which improves foraging opportunities for a variety of wildlife species including the Mexican spotted owl. Conversely, a decrease in large diameter trees would result in a reduction of cover

and roosting sites for this species. Down woody debris is expected to increase with all actions of the proposed alternative since some activity fuels will be left on the ground. Down woody debris will still be below Forest Plan minimum guidelines but is increasing with this action.

California Condor

Analysis of effects will be based on possible disturbance and alteration of potentially suitable nesting/foraging habitat.

The project area is located near 6.1 miles of cliff habitat located within 1 mile of the project boundary. There are 0.3 miles of cliff habitat located within the project boundary that is largely unsuitable for this species since these cliffs are not large enough to support nesting. California condors require relatively open habitats for foraging. Implementation of the Modified Proposed Action would result in more open habitat structure especially in the group selection patch cut and reforestation area that includes site preparation. However, these openings are likely not large enough for condors to use. Condors have not been known to utilize the project area nor in the CEA.

Implementation of the Modified Proposed Action may lead to a possible displacement of foraging condors due to implementation of project activities. This direct effect is expected to be minimal since this area is not known to be utilized by condors and these birds are highly habituated to human's activities.

SENSITIVE WILDLIFE SPECIES

American Peregrine Falcon

There are no known peregrine territories in or near the project area although suitable cliff habitat exists within 1 mile of the project boundary. It is possible that peregrine falcons would venture into the project area for foraging given that most foraging occurs within one mile of a nest area. If peregrine falcons were to use the area for foraging, there could be some direct impact due to displacement of foraging birds due to noise disturbance. This is expected to be minimal given the lack of documented use.

Vegetation treatments would open the treatment areas up and increase available sunlight resulting in a net increase in: (1) deciduous tree/shrub growth in the aspen type and (2) grass, forbs, and shrubs in the ponderosa pine and mixed conifer sites. The overall increase in vegetative diversity in the long term would likely increase diversity of prey species inhabiting these areas. Hence, the effects of treating these areas would result in a net improvement to potential peregrine falcon foraging habitat in the proposed treatment areas within 1.0 miles of suitable cliff habitat and along the three perennial stream corridors.

Foraging peregrine falcons may be directly impacted through temporary displacement by project activities that occur during all seasons except winter. This direct impact would most likely occur with those activities located within one to two miles of rim habitat. All treatments are located within 1 mile of suitable rim habitat. Given the small likelihood of peregrine falcons using the project area, this direct impact is expected to be minor.

Flammulated Owl

In general, group selection logging, WUI treatment, ponderosa pine improvement, pinyon and juniper control site preparation, reforestation, and pile burning or other project activities that occur during the late fall and winter months would not disturb this species. Activities that occur during the spring, summer, or early fall may directly impact nesting owls through displacement of foraging owls or nest abandonment due to noise and associated human disturbance and possible nest tree removal. Nesting could occur in the ponderosa pine, mixed conifer, and aspen stands (1,140 acres within treatment units) although primary breeding is within ponderosa pine which comprises approximately 824 acres within treatment units. Spring pile burning may generate some smoke, but given this birds' tolerance to humans, it is unlikely that any birds would be displaced. Overall, disturbance due to project implementation would be minimal since use of the area by owls has been minimal and no owls were detected during project specific surveys.

Some 3,800 acres of primary and secondary flammulated owl nesting and foraging habitat would be treated with the Modified Proposed Action. Generally, basal area in most cover types would not change dramatically with the Modified Proposed Action since dead trees are not considered in basal area calculations. Leaving snags within the group selection harvest and reforestation treatment areas will help maintain some flammulated owl nesting habitat. Stem densities are reduced in all cover types and have dropped below tolerance levels for this species ((Goggans 1986) and (Bull et al. 1990) as reviewed in(McCallum 1994)). Reforestation will help recover basal area and stem density more quickly over the long-term than no action. Down wood would increase with implementation and snags greater than 18" DBH should be maintained at 144 snags per 100 acres in the ponderosa pine type, and 1,400 snags per 100 acres in the mixed conifer type. However, there is the possibility of existing snags being removed for safety reasons or through inadvertent damage due to project activities. If this were to occur, it would be a negative indirect impact that would reduce nesting habitat quality in the short-term until other snags are recruited. This impact is expected to be minor since flammulated owls have not been documented using the area, they were not detected during project-specific surveys, and the relative size of the treatment area is small compared to the amount of adjacent habitat that will not be treated.

Overall, understory vegetation diversity would increase in the long term. This would benefit flammulated owl prey species that utilize robust understory vegetation and adequate amounts of down woody debris.

Stand scale response to logging indicates that selective logging can create the open stand structure that "characterizes this owl's habitat everywhere it has been studied . . . as long as large old trees, open physiognomy, and some dense vegetation for roosting persists"(McCallum 1994). Hence, given that past insect infestations and resulting logging has removed most of the large old trees, down woody debris is underrepresented, and dense vegetation exists in some areas, group selection logging would impact habitat further. However, the Modified Proposed Action is designed to improve flammulated owl habitat over time since it allows for artificial regeneration, creates a more diverse structure forest, and creates a down wood component as a result of logging and site prep. Planting will allow new stands to move through forest succession more rapidly than the No Action (natural regeneration). Following the reforestation activity, planted stands will advance into the VSS 2 stage by approximately 2033, VSS 3 by 2053, and

VSS 4 by 2153. Naturally regenerated stands would not likely hit VSS 2 until approximately 2063, VSS 3 by 2093 and VSS 4 by 2183 (Gustafson 2015). This will be more beneficial to flammulated owl foraging and nesting needs than leaving it in its current condition since owls prefer diverse forested conditions for nesting and foraging over forested conditions that are dominated by a single age class of trees.

Northern Goshawk

In general, group selection timber harvest, pinyon and juniper control, ponderosa pine improvement, cottonwood and willow improvement, WUI treatments, and reforestation activities would have the potential to disturb foraging or nesting northern goshawks that may be in the area if activities were to occur during spring and summer months.

Implementation of the Modified Proposed Action would result in treatment of approximately 847 acres of suitable habitat within the Jake Hollow Foraging Area (FA) and 1,044 acres within the Hall Creek Foraging Area and an additional 374 acres of general Foraging Area habitat not tied directly to an existing territory. No treatments are proposed within the Under Barney territory. These figures are not exclusive in that some overlap of territory Foraging Areas exists so some acres that are treated in the Hall Creek territory are also treated and counted in the Jake Hollow territory. Approximately 654 acres are overlapping with both FAs meaning all but 97 treatment acres in the Jake Hollow FA are overlapping with Hall Creek FA.

The Modified Proposed Action would indirectly impact the Jake Hollow and Hall Creek goshawk territories PFAs and NAs through vegetation alteration including group selection timber harvest, ponderosa pine improvement, WUI treatment, and pinyon-juniper tree control. No treatments are proposed within the Under Barney territory PFA or NA. Approximately 450 acres of the Jake Hollow's 1,396 acre PFA are proposed for treatment representing 32 percent of the PFA. This includes approximately 21 acres of treatment within the Nest Area. Approximately 425 acres of the Hall Creek's 563 acre PFA are proposed for treatment representing 75 percent of the PFA. Over 450 acres of both PFAs are the same acres with overlapping PFAs which will not all be treated but will have numerous 1-2 acre clear-fell openings created within the larger area. Commercial thinning will occur in areas outside of these clear-fell areas down to approximately 90 square feet of basal area in the PFAs and 60 – 80 square feet of basal area outside of PFAs.

The Modified Proposed Action would directly impact goshawks if they were present during project activities which could lead to displacement of birds using the area. Project design features exist to minimize direct disturbance to goshawks through timing restrictions if any territory is determined to be occupied.

Currently, VSS distributions within goshawk home ranges impacted by project activities are dominated by VSS 3. The VSS system is based on dominant size (diameter) of live trees. Because of this, the proposed group selection harvest and other treatments within the ponderosa pine cover type will not remove enough volume of any VSS class to change the VSS of most of the stands within the Jake Hollow territory (see Vegetation Resource Report). However, early stand structure (VSS 1) and mid-to-late vegetation stand structure (VSS 4-5) would be achieved faster with the Modified Proposed Action than with the No Action due to clear-fell group

selection harvest and other activities that open up forest canopies, thereby reducing competition for resources and increasing growth rates.

The VSS distribution within the FAs of the Hall Creek and Jake Hollow territories will change slightly with the Modified Proposed Action. The group selection clear-fell areas would reduce VSS 3 representation from 66 percent in the Hall Creek territory to 60 percent, increase VSS 1 representation from 0 to 5.0 percent, and increase VSS 5 representation by a modest 1.0 percent. The group selection clear-fell areas would reduce VSS 3 representation from 62 to 61 percent in the Jake Hollow territory, increase VSS 5 from 1.0 percent to 2.0 percent, and reduce VSS 4 acres from 34 percent to 33 percent (Table 21). No VSS change is anticipated for the Under Barney territory since no proposed activities will occur. VSS distributions within goshawk home ranges will move toward the desired condition with implementation of the Modified Proposed Action although desired condition will only be met after many entries over several decades.

Table 21. Current and Projected VSS within the Goshawk Home Ranges that occur within the Mitchell Spring Project Area with the Modified Proposed Action.

		VSS 1 0-0.9" (DBH)	VSS 2 1-4.9" (DBH)	VSS 3 5-11.9" (DBH)	VSS 4 12-17.9" (DBH)	VSS 5 18-22.9" (DBH)	VSS 6 >23" (DBH)
Desired Condition		10%	10 %	20 %	20 %	20 %	20 %
Hall Creek Home Range (FA)	Current VSS	0%	0%	66.0%	28.0%	0%	5.0%
	Projected VSS	6.0%	0%	60.0%	28.0%	1.0%	5.0%
Jake Hollow Home Range (FA)	Current VSS	0%	1.0%	62.0%	34.0%	1.0%	3.0%
	Projected VSS	0%	1.0%	61.0%	33.0%	2.0%	3.0%
Under Barney Home Range (FA)	Current VSS	0%	1.0%	86.0%	10.0%	3.0%	0%
	Projected VSS	0%	1.0%	86.0%	10.0%	3.0%	0%

The Modified Proposed Action will reduce canopy cover in the short-term due to group selection clear-fell treatments; however commercial thinning (promoting clumping and grouping of trees and reduced competition due to thinning of more densely stocked stands) will allow trees to grow more quickly than with no action. This will increase canopy cover in the long-term which is represented in the Stand Density Index (SDI). Since the canopy cover Forest Plan standard is for treatments designed to promote VSS 4, 5 and 6 stands, the Modified Proposed Action moves the group selection clear-fell areas closer to recommendations outlined in Standard H in the Goshawk Amendment (USDA 2000e).

Snags greater than 18" DBH should be maintained at 144 snags per 100 acres in the ponderosa pine type, and 1,400 snags per 100 acres in the mixed conifer type. However, there is the possibility of existing snags being removed for safety reasons or through inadvertent damage due to project activities. If this were to occur, it would be a negative indirect impact that would reduce nesting habitat quality in the short-term until other snags are recruited. This impact is expected to be minor since northern goshawk have not been documented using the area, they

were not detected during project-specific surveys, and the relative size of the treatment area is small compared to the amount of adjacent habitat that will not be treated.

Overall, potential foraging and nesting habitat would be improved for this species in the long term (5+ years) as trees mature and provide an array of VSS class vegetation and a net increase in preferred prey species habitat over time. Additionally, project design features (PDFs) in areas proposed for all treatments would maintain the recommended amounts of down wood and snags throughout the treatment area, and if snags are underrepresented, green trees will be left for future snag recruitment

Townsend's Big-eared Bat and Spotted Bat

In general, group selection timber harvest, pinyon and juniper control, ponderosa pine improvement, cottonwood and willow improvement, WUI treatments, and reforestation activities would have the potential to alter foraging habitat within openings and along riparian areas. However, treatments as proposed are likely to improve foraging conditions by creating more open forested conditions. Activities that occur during the fall and winter months would not disturb these species which are likely hibernating in areas outside of the project area. Activities that occur during the spring, summer, or fall should not directly impact foraging bats since these activities occur during daylight hours. However, smoke that lingers through the night associated with spring pile burning might impact this species causing a short term displacement from the area. There is ample foraging habitat adjacent to the project area which both bat species could use that will not be impacted by smoke.

In summary, implementation of the Modified Proposed Action would have a net beneficial impact on these two bat species due to creation of more open forested condition within riparian vegetation in the WUI treatment and increases in down woody debris that bat prey species utilize, which will improve overall foraging habitat for bats.

Colorado River Cutthroat Trout

Pinyon-Juniper Control

Mechanical thinning of pinyon-juniper would be done with ground based equipment (e.g., bobcat/skid steer, tractor) fitted with a chipping or masticating heads (i.e., bullhog); effects would be similar to commercial timber thinning and/or timber harvest. The direct and indirect effects of timber harvest are discussed in the Dixie National Forest document "Effects of Timber Harvest and Related Activities on Fish and Aquatic Macroinvertebrates"(Robertson, S. 1997a). This paper is incorporated by reference.

Recent studies have found that the mulching of pinyon juniper with the masticator decrease runoff and sediment generation while not increasing soil compaction (Bates, J.D. et al. 2011; Bates, J. D. et al. 2000; Cline et al. 2010; Hatchett et al. 2006; Pierson et al. 2007).

The closest treatment to occupied fish habitat would be over 1,500 feet from Hall Creek and only 11 acres in size. It is unlikely that the proposed Pinyon-Juniper Control Treatments would have any direct or indirect effects to fish habitat.

Ponderosa and Mixed Conifer Group Selection

The direct and indirect effects of timber harvest are discussed in the Dixie National Forest document “Effects of Timber Harvest and Related Activities on Fish and Aquatic Macroinvertebrates”(Robertson, S. 1997a). This paper is incorporated by reference.

Potential direct impacts to fish from group selection harvest activities would be caused by machinery crushing fish and/or eggs, or spilling gas, oil, or some other toxic compound directly into a fish-bearing stream. Stream temperature regulates metabolism in fish and elevating temperatures can cause changes in growth, survival, and reproductive success (Bell 2006).

The Hydrology and Soils Specialist Reports discusses the potential for increased sedimentation from equipment use and canopy removal associated with the Modified Proposed Action. Any increased influx of sediment from the Modified Proposed Action would have a negative effect on fish and fish habitat present within and downstream from the proposed project area (Waters 1995). Riparian buffer zones have been shown to moderate the effects of overland sediment flow and prevent stream temperature increases (Belt et al. 1992; Chamberlain et al. 1991; Clinton 2011; DeWalle 2010; Hawes and Smith 2005).

The limits on mechanized equipment use listed in Appendix A to the Hydrology Specialist Report, along with the additional Erosion Prevention and Control direction provided in the same Appendix A, will help to limit effects from mechanical treatments. Overall, group selection harvest treatments have the potential to increase erosion and runoff into occupied or potential fish habitat along portions of Birch Creek and Hall Creek, as well as to increase sediment transport to the downstream areas of these streams in the short-term (1-2 years following treatment). Ground cover requirements listed in Appendix A to the Hydrology Specialist Report, the maintenance of buffers around Aquatic Habitat Management Zones, and the regrowth of grasses, forbs, and other vegetation should reduce erosion and sedimentation in both the short-term and the long-term (5-10 years following treatment).

Artificial Reforestation with Site Preparation

The unit proposed for Artificial Reforestation with Site Preparation is over 550 feet away from the upper perennial portion of Birch Creek, so no direct impacts are expected to fish or fish habitat.

Mowing understory vegetation could be expected to produce similar types of upland erosion as discussed under the Pinyon-Juniper Control section above.

Fire and its associated impacts to ground cover and soil stability can potentially have at least short-term negative impacts to aquatic habitat and aquatic organisms (Arkle et al. 2010; Bury 2004; Gresswell 1999; Hossack et al. 2006; Mahlum et al. 2011; Minshall 2003; Minshall et al. 1989; Rieman et al. 2003; Sestrich et al. 2011; Spencer et al. 2003). The impacts of sediment introduction to aquatic habitat are discussed under the pinyon-juniper control and ponderosa and mixed conifer group selection treatments above.

Ponderosa Pine Stand Improvement

Since no perennial fish bearing streams are overlapped by this treatment, no effects to stream temperature or shading are expected from the proposed Ponderosa Pine Stand Improvement treatments. Since no machinery is being used and slash will be lopped and scattered throughout the majority of the treatment units, little to no effect of sediment delivery is expected to fish or fish-bearing streams.

Pile burning would remove surface vegetation and increase potential for erosion; however, FSR 30151 within the proposed treatment is over 150 feet from any perennial fish-bearing streams which should minimize impacts to fish and their habitat. The limits on mechanized equipment use listed in Appendix A to the Hydrology Specialist Report, along with the additional Erosion Prevention and Control direction provided in the same Appendix, will help to limit effects from mechanical treatments. The direction regarding Prescribed Fire in Appendix A of the Hydrology Specialist Report will also help to ameliorate these impacts. Specifically, in addition to the direction described under the group selection harvest treatment, Appendix A directs to “Avoid broadcast and pile burning within 100 feet of all perennial streams and outside of any riparian vegetation (whichever is greater).”

Wildland Urban Interface Treatment

The effects of the WUI treatment would be similar to the effects of the group selection harvest and overlap 0.3 miles of Birch Creek, 0.1 miles of Hall Creek, and 0.1 miles of Water Canyon Creek. Potential effects include a loss of ground cover, displacement of soil, compaction of soils, increased erosion and fine sediment influx into adjacent stream channels, and changes in water quantity and quality. Chipping/mulching on site would reduce these impacts, while broadcast burning, and even pile burning, could exacerbate these potential impacts by removing additional ground cover. As with the group selection harvest, the direction on Erosion Prevention and Control, Aquatic Management Zones, Servicing and Refueling of Equipment, Ground Based Skidding and Yarding Operations, and Use of Prescribed Fire in Appendix A of the Hydrology Specialist Report help to ameliorate these impacts.

Use of Roads and Update to the Transportation Plan.

The direct and indirect effects of roads on fish and aquatic habitat are well documented (Furniss et al. 1991; Trombulak and Frissell 2000). Low water crossings have the potential for direct impacts to fish and other aquatic habitat through crushing adults, juveniles or eggs, as well as displacing rocks, logs, and other habitat. The indirect effect of roads and road crossings is the generation of sediment that is subsequently delivered and deposited into aquatic habitat. The impacts of sediment to fish and fish habitat are discussed under the ponderosa and mixed conifer group selection treatments above.

The Soils Specialist Report for the Mitchell Spring Vegetation Improvement project contains a detailed analysis of the effects of the transportation plan for the project as it pertains to detrimental soil disturbance, erosion, and sediment generation. Specific to aquatic resources, FSR 33939 crosses two perennial streams in the Birch Creek headwaters and goes through a wet meadow. While CRCT are not known to occupy habitats this high in the drainage, recently completed Aquatic Organism Passage projects increase the potential for CRCT occupancy in

more headwater areas of Birch Creek. SWCPs related to the maintenance of roads identified in the Soils Specialist Report and in Appendix A of the Hydrology Specialist Report will help to minimize sediment delivery from FSR 33939 and FSR 30151 into Birch and Hall Creeks, respectively.

Increase in use from project activities on FSR 30150 could increase sediment generation, which is of specific concern to aquatic resources where FSR 30150 crosses Hall Creek. Based on modelling, increased use from project activities at this FSR 30150 crossing is expected to cause a short-term (project implementation time period) increase in sediment generation to Hall Creek; however, the road currently shows little sign of contributing sediment to the stream (Hydrology Specialist Report). SWCPs related to the maintenance of roads identified in the Soils Specialist Report and in Appendix A of the Hydrology Specialist Report will help to minimize sediment delivery from this route into Hall Creek.

Additionally, using roads classified as closed and non-system routes for project activities has the potential to increase sediment generation by 200-300 percent (Soils Specialist Report).

Following project use, these roads will be fully decommissioned. Of these routes, only one comes within 100 feet from a perennial fish-bearing stream. Approximately 325 feet of unauthorized route (G4092) comes within 100 feet of Hall Creek. Increased use of this route for project activities would have the potential to affect both shading and sedimentation into the adjacent section of Hall Creek. Using G4092 would have a negative impact on CRCT habitat in Hall Creek that would be difficult to mitigate based on its proximity to the stream. In order to minimize potential impacts to CRCT and their habitat, G4092 should be removed from use for project activities.

As discussed in the Hydrology and Soils Specialist Reports, fully decommissioning routes currently classified as closed under the Dixie MTP ROD and existing non-system routes not addressed in the Dixie MTP ROD following their use for project activities would result in reduced sediment generation over the existing condition in the long-term.

Summary

Overall project activities proposed under Alternative 2 have the potential to directly impact CRCT and their habitat through increased use of low water crossings on FSR 30151 and FSR 33939. Increased traffic on FSR 30151 related to thinning activities is expected to be minor, which should reduce any direct impacts to CRCT and their habitat. CRCT are not known to occupy Birch Creek as far upstream as the FSR 33939 crossing. Direct impacts from equipment use off of designated haul routes should be ameliorated by the use of SWCPs outlined in Appendix A of the Hydrology Specialist Report. Project activities have the potential to indirectly impact CRCT and their habitat by increasing sediment generation, reducing shading, and changing water quality. With the exception of the designation of unauthorized route G4092 as a temporary project road, these impacts should be ameliorated by SWCPs outlined in Appendix A to the Hydrology Specialist Report. The use of G4092 for project activities could negatively affect CRCT habitat through reduced shading, decreased bank stability, and increased sediment deposition. In order to protect CRCT habitat G4092 should not be used for project activities.

Boreal Toad

Pinyon-Juniper Control

As discussed in the direct and indirect effects of the proposed Pinyon-Juniper Control on fish and fish habitat, the Pinyon-Juniper Control has similarities to timber harvest activities in terms of its effects. Several authors have examined the impacts of timber harvest activities on amphibians (Ashton et al. 2006; deMaynadier and Hunter 1995; Maxell 2000; Semlitsch et al. 2008). Project equipment can also cause direct loss of aquatic habitat. Most of the potential impacts to amphibian populations associated with timber harvest are indirect, such as sedimentation, loss of canopy cover, and loss of ground cover. Amphibian densities have been shown to be significantly lower in streams with higher sediment loads (Gillepsie 2002; Welsh, H. H. and Ollivier 1998). Sedimentation of open water areas can reduce their capacity to hold water and eventually lead to a reduction in open water habitat.

Potential direct effects to individual boreal toad or other amphibians would be from strike mortality associated with the tractors/skid steers/bobcats to be used in the proposed mechanical thinning treatments. Boreal toad are known to use both aquatic and upland areas, which may increase the potential for individuals to be directly impacted by equipment used during vegetation removal activities (Goates et al. 2007; Hogrefe et al. 2005; Schmetterling and Young 2008; Thompson 2004; Thompson et al. 2004).

The proposed Pinyon-Juniper Control activities are not within 100 feet from any aquatic habitat and are not expected to cause appreciable increases in sediment generation. Additionally, as discussed under the Affected Environment section, boreal toads are not known to occur in the project area or CEA; therefore, the proposed Pinyon-Juniper Control activities are unlikely to have direct or indirect impacts to boreal toad or their habitat.

Ponderosa and Mixed Conifer Group Selection

Similar to the proposed Pinyon-Juniper control activities, potential impacts from the proposed ponderosa and mixed conifer group selection to boreal toad and their habitat would be the result of direct mortality from equipment, direct impacts to aquatic habitat related to equipment, and indirect effects to aquatic habitat from sedimentation, loss of shading, and/or loss of ground cover. Effects to perennial fish-bearing streams are discussed in the Colorado River cutthroat trout and nonnative trout sections. In addition, the Hydrology Specialist Report identifies several areas of potential amphibian habitat in the section discussing areas of hydrologic concern.

Since boreal toads are not known from the project area or CEA, direct and indirect effects to individuals are unlikely; however, impacts to potential habitat are possible. Limits on mechanized equipment use, designation of a 100-foot riparian buffer and Erosion Prevention and Control direction provided in the listed in Appendix A to the Hydrology Specialist Report will help to limit effects from the group selection treatments proposed in Alternative 2.

Artificial Reforestation with Site Preparation

The unit proposed for Artificial Reforestation with Site Preparation is over 150 feet away from wetlands in the headwaters of Birch Creek. Since most boreal toad use would be expected to be within 100 feet of wet areas and boreal toad are not known from the project area or CEA, direct

and indirect effects to individuals are unlikely; however, impacts to potential habitat are possible. As with the group selection harvest the direction on Erosion Prevention and Control, Aquatic Management Zones, Servicing and Refueling of Equipment, Ground Based Skidding and Yarding Operations, and Use of Prescribed Fire in Appendix A of the Hydrology Specialist Report help to ameliorate these impacts.

Wildland Urban Interface Treatment

Since most boreal toad use would be expected to be within 100 feet of wet areas and boreal toad are not known from the project area or CEA, direct and indirect effects to individuals are unlikely; however, impacts to potential habitat are possible. Once again the direction on Erosion Prevention and Control, Aquatic Management Zones, Servicing and Refueling of Equipment, and Use of Prescribed Fire in Appendix A of the Hydrology Specialist Report help to ameliorate these impacts.

Use of Roads and Update to the Transportation Plan

Potential direct impacts to amphibians through strike mortality are probably the highest at the FSR 30151 and FSR 33939 road crossings, as well as the use of unauthorized route G4092 as a temporary project road. Potential sedimentation impacts to amphibian habitat would be similar to those described under the Colorado River cutthroat trout section. Boreal toad are not known from the project area or CEA, so direct and indirect effects to individuals are unlikely; however, impacts to potential habitat are possible.

Summary

Overall project activities proposed under Alternative 2 have the potential to directly impact boreal toad and their habitat through increased use of low water crossings on FSR 30151 and FSR 33939. Boreal toad are not known to occur in the project area or CEA, so no direct or indirect impacts to boreal toad individuals are expected from implementation of Alternative 2. Direct impacts to habitat from equipment use off of designated haul routes should be ameliorated by the use of SWCPs outlined in Appendix A of the Hydrology Specialist Report. Project activities have the potential to indirectly impact amphibian habitat by increasing sediment generation, reducing shading, and changing water quality. With the exception of the designation of unauthorized route G4092 as a temporary project road, these impacts should be ameliorated by SWCPs outlined in Appendix A to the Hydrology Specialist Report. The use of G4092 for project activities could negatively impact aquatic habitat through reduced shading, decreased bank stability, and increased sediment deposition; however this high gradient stream segment would not be considered high quality boreal toad habitat (Rodriguez 2012).

WILDLIFE MANAGEMENT INDICATOR SPECIES

Mule Deer and Rocky Mountain Elk

Vegetation treatments would result in a short-term displacement of mule deer and elk in the spring, summer and early fall months. However, the area surrounding the project area offers good, alternative cover for displaced animals. Winter activities are not anticipated for this project and would not impact big game in years of high snow when big game would not likely be using the area. If activities were to occur during the winter months when snowpack is light,

wintering big game could be impacted directly and cause short-term displacement and likely increased expenditure of energy.

Impacts to hiding and thermal cover will occur with all vegetation actions resulting in overstory tree removal or understory vegetation alteration. Vegetation conditions in the ponderosa pine type is likely not considered suitable cover capable of hiding 90 percent of a deer or elk at 200 feet at this time. This action may reduce this further, causing big game to utilize other areas for cover in the short term and beyond until young trees and shrubs are tall enough to contribute to cover. Cover in the mixed conifer type is capable of hiding 90 percent of a deer or elk at 200 feet and will likely remain suitable cover following project activities.

The areas proposed for treatment in the project area are considered summer substantial and winter substantial habitat for elk. The Modified Proposed Action will impact approximately 966 acres of summer substantial habitat out of 2,372 acres total or 41 percent and 548 acres of substantial winter habitat out of 1,941 acres total or 28 percent for elk.

The areas proposed for treatment in the project area are considered summer substantial and winter crucial habitat for deer. The Modified Proposed Action will impact approximately 1045 acres of summer substantial out of 3,264 acres total or 32 percent and 469 acres of winter crucial habitat out of 1,049 acres total or 45 percent. These impacts comprise a substantial amount of each habitat classification for deer and elk in the project area; however taking into consideration the amount of total habitat within the greater CEA, the area treated is less than 5 percent for each habitat classification. Therefore, this impact is expected to be minimal in the short-term and will decrease further as vegetation becomes more established and deer and elk use increases.

There are a variety of dispersed recreation opportunities in the project area. Most of the road mileage existing in the project area is bordering ponderosa pine and mixed conifer habitats and accesses dispersed camping areas, high clearance vehicle recreation opportunities, and hunting areas. Currently there are approximately 7.18 miles of open roads and trails within the project area, an additional 1.92 miles of temporary roads proposed to be used during the life of the project, and an additional 6.30 miles of proposed new roads added to the transportation system. The temporary roads will be demolished and re-seeded following project activities.

Open road densities in the project area are currently 1.06 miles of road per square mile of habitat. Road densities in the project area would increase from 1.06 to 2.43 miles of road per square mile of habitat while activities are occurring and then would drop to 2.0 miles of road per square mile of habitat once temporary roads are closed and decommissioned. Question #2 of the Open Road Density Guideline (USDA 1998b) provides direction for assessing the scale at which the road density guideline should be applied. Road density calculations and impacts for this area are better addressed at the 2009 Forest wide Motorized Travel Plan (USDA 2009b) EIS Implementation Area (IA) level as opposed to the project area level. This is primarily a function of the recreation impact of the project area and also a function of the current condition of MTP implementation. None of these new proposed roads or temporary roads has been physically closed since the MTP decision in 2009, effectively making the current road density 2.43 miles of road per square mile of habitat. Administratively, these roads have been closed since 2009 on paper but not on the ground; any discussion of proposed project impacts from road density on deer and elk use patterns is a reflection of the current condition and will improve to 2.0 miles of road per square mile of habitat if temporary roads are truly closed upon completion of the

project. This would improve habitat effectiveness for deer and elk with an overall decrease in road density. Since big game are wide-ranging species, road densities reflected in the big game CEA (MTP IAs the project intersects) are the appropriate scale to analyze and will be discussed in the cumulative effects section.

Northern Flicker

Implementation of vegetation treatments would result in a short-term displacement of northern flickers. Even though snags are abundant within the project area and will remain abundant post treatment, disruption of nesting birds will likely still occur. However, there is additional habitat available outside the Project Area for this species to use in the event of displacement.

Some 1,514 acres out of 4,245 total acres, or roughly 36 percent of total suitable habitat, would be affected with implementation of the Modified Proposed Action. This impact is expected to be minimal given the large area surrounding the project area of suitable habitat that will not be impacted and also given the propensity of this species to be a habitat generalist that can move into any adjacent forested habitat and utilize these areas for nesting and foraging. In the short term, the removal of individual trees would reduce nesting and foraging opportunities for this species; however, snags would be maintained throughout the mixed conifer and ponderosa pine types, downed wood would increase, and vegetative diversity would increase in the long term. All of these structural components would maintain or improve habitat for flicker prey (insects) in the long term.

Impacts from human disturbance would occur with the Modified Proposed Action. Increased vehicular traffic (logging trucks, work trucks), heavy equipment operation, and pile burning with associated smoke, would have the potential to displace foraging and nesting individuals for short periods of time. That displacement could result in nest failure or territory changes, or territory reductions while the activities occurred. Project design features in place for nesting goshawks could also protect this species and will help reduce direct impacts from project activities if goshawk territories were occupied or active. These design features will help reduce the possibility of take under the migratory bird treaty act and will help meet the intent of the MOU with the US Fish and Wildlife Service as well as Executive Order 13186 which directs the Forest Service in meeting the intent of the MBTA.

Wild Turkey

Vegetation treatments would result in a short-term displacement of wild turkeys, which use the project area throughout the year for foraging, roosting, and cover. Displacement would be short term and there is abundant habitat outside of the Project Area for this species to use during project implementation.

There would be a short term reduction in cover (nesting), roosting, and associated foraging opportunities on 1,514 acres out of 4,278 suitable habitat acres with the implementation of the Modified Proposed Action. Roosting habitat would be reduced due to group selection clear-fell areas totaling approximately 770 acres. Not all 770 acres will be treated but several 1-2 acre openings within this area will have all trees removed leaving plenty of roost trees remaining across this area. Foraging and nesting habitat is currently in good condition and is expected to improve as forested conditions become more open and down woody debris increases which

would lead to better habitat for insects and understory vegetation and nest habitat structure.

Nonnative Trout

Pinyon-Juniper Control

No treatments are proposed in the Upper North Creek watershed; no effects are expected to nonnative trout or their habitat.

Ponderosa and Mixed Conifer Group Selection

No treatments are proposed in the Upper North Creek watershed; no effects are expected to nonnative trout or their habitat.

Artificial Reforestation with Site Preparation

No treatments are proposed in the Upper North Creek watershed; no effects are expected to nonnative trout or their habitat.

Wildland Urban Interface Treatment

No treatments are proposed in the Upper North Creek watershed; no effects are expected to nonnative trout or their habitat.

Use of Roads and Update to the Transportation Plan

The only part of Alternative 2 that falls in the within the Upper North Creek watershed is the reclassification of 1.5 miles of FSR 30150 and 0.8 miles of FSR 30538 from closed under the Dixie MTP ROD to routes that would be seasonally open to the public for full size vehicles. The routes to be Open to All have existing road beds and receive unauthorized use by the public. Within the Upper North Creek watershed these routes do not cross or come within 100 feet of any aquatic resources. FSR 30150 crosses one intermittent channel that eventually feeds North Creek 4.1 miles downstream from the Reservoir. No direct or indirect effects to fish or aquatic habitat are expected from reclassifying the portions of FSR 30150 and FSR 30538 within the Upper North Creek Watershed.

Summary

The reclassification of 1.5 miles of FSR 30150 and 0.8 miles of FSR 30538 from closed under the Dixie MTP ROD to routes that would be seasonally open to the public for full size vehicles would have no direct or indirect impacts to fish or fish habitat over the existing condition because these routes still exist on the ground and are a considerable distance from any live water features. Since this is the only action occurring in the Upper North Creek watershed under Alternative 2, Alternative 2 will have no direct or indirect impacts to nonnative trout or their habitat.

OTHER SPECIES OF CONCERN

Virginia's Warbler

The Modified Proposed Action may result in the unintentional take of individuals. However, the project complies with the U.S. Fish and Wildlife Service Director's Order #131 related to applicability of the Migratory Bird Treaty Act to federal agencies and requirements for permits. In addition, these alternatives are compliant with the Executive Order 13186 (Federal Register 2001a), because the analysis meets our obligation as defined under the Memorandum of Understanding, and specifically because suitable habitat surrounding habitat impacted from project activities is available to these bird species to disperse to and use. Project design features in place for nesting goshawks would also protect this species and will help reduce direct impacts from project activities due to timing limitations restricting activities that will occur during these species breeding seasons as long as goshawk territories are active or occupied.

Implementation of the pinyon and juniper removal treatments on approximately 30 acres of secondary pinyon-juniper habitat within the 4,332 acre project area could result in the displacement of Virginia's warblers using the pinyon-juniper areas within the project area. This is expected to be a minor impact since their primary habitat is mountain shrub habitat with secondary habitat being more established pinyon-juniper stands that are older and more likely in a Phase II or III classification as opposed to smaller trees encroaching into ponderosa pine.

Lewis's Woodpecker

Vegetation treatments that occur during the fall, winter, and early spring months (September-March) will have little to no direct impacts to migratory bird species. Migratory birds may be indirectly impacted from project activities that occur during the non-nesting season through loss of habitat and possible past nest tree removal. Vegetation treatments that occur during the late spring and summer months will directly impact migratory birds, including the Lewis's woodpecker due to noise, smoke, and dust generated by project activities.

Snags greater than 18" DBH should be maintained at 144 snags per 100 acres in the ponderosa pine type, and 1,400 snags per 100 acres in the mixed conifer type. However, there is the possibility of existing snags being removed for safety reasons or through inadvertent damage due to project activities. If this were to occur, it would be a negative indirect impact that would reduce nesting habitat quality in the short-term until other snags are recruited. This impact is expected to be minor since Lewis's woodpecker have not been documented using the area, they were not detected during project specific surveys, and the relative size of the treatment area is small compared to the amount of adjacent habitat that will not be treated.

Impacts from habitat loss in primary breeding habitat (ponderosa pine) is expected to occur as group selection clear-fell treatments are applied, thus removing overstory trees utilized for perching, foraging, and possibly nesting if snags are removed. This impact is long-term but is offset by the fact that overall health of these stands is improved with a move toward desired condition VSS distribution, thus adding diversity and removing competition from overstocked stands leading to more healthy trees over time.

Black-throated Gray Warbler

Implementation of the pinyon and juniper removal treatments on approximately 30 acres within the ponderosa pine cover type within the 4,332 acre project area could result in the displacement of black-throated gray warblers using the pinyon-juniper areas within the project area. This is expected to be a minor impact since their primary habitat is more established pinyon-juniper stands that are older and more likely in a Phase II or III classification as opposed to smaller trees encroaching into ponderosa pine.

Gray Vireo

Implementation of the pinyon and juniper removal treatments on approximately 30 acres within the ponderosa pine cover type within the 4,332 acre project area could result in the displacement of gray vireo using the pinyon-juniper areas within the project area. This is expected to be a minor impact since their primary habitat is more established pinyon-juniper stands that are older and more likely in a Phase II or III classification as opposed to smaller trees encroaching into ponderosa pine.

Broad-tailed Hummingbird

Vegetation treatments that occur during the fall, winter, and early spring months (September-March) will have little to no direct impacts to migratory bird species. Migratory birds may be indirectly impacted from project activities that occur during the non-nesting season through loss of habitat and possible nest tree removal. Vegetation treatments that occur during the late spring and summer months will directly impact migratory birds, including the broad-tailed hummingbird due to noise, smoke, and dust generated by project activities—as well as the possibility that some early spring nests might be destroyed in the process of implementing some activities, including slash management/pile burning. Given that some of these treatments could occur during the fall and winter months, disturbance impacts to migratory birds are expected to be short term, indirect and limited on these acres.

Impacts from habitat loss in primary breeding habitat (mountain riparian) is expected to occur given that some treatments such as WUI are expected to occur near perennial streams as are other treatments. There are 3 perennial streams in the project area that are primary habitat for this species. However, the overall impact to hummingbirds is expected to be minimal to non-existent due to the PDFs that buffer and protect streams.

Cumulative Effects**THREATENED AND ENDANGERED WILDLIFE SPECIES****Mexican Spotted Owl**

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was chosen based on this species potential winter juvenile migration patterns from the Capital Reef National Park and Grand Staircase/Escalante areas to the project area.

The habitat component with the greatest potential for cumulative effects includes snags and down logs. The effects of timber sales, fire suppression, recreational uses (especially firewood cutting), and camping have all contributed to loss of snags and down logs. However, snag densities are currently above Forest Plan minimums across the CEA area in mixed conifer cover type due to insects that have contributed to mortality of Douglas fir. Snag densities are low in the ponderosa pine cover type due to past timber harvest in the 1980s that occurred as a result of localized outbreak of mountain pine beetles. Implementing any action alternative may decrease snag densities across the CEA moving this trend downward. Snags that are left following project activities may fall over within a few years due to windthrow, therefore this effect could be cumulative with other vegetation treatments. Down woody debris is lacking across the CEA in ponderosa pine and this action will increase down woody component.

Closing roads with the Forest-wide Access Management Plan would help reduce areas that are easily accessible to woodcutting. However, given the low density of dead trees across the CEA as well as the low likelihood of the public wanting to cut dead trees in the project or CEA due to low numbers, these cumulative effects would not likely be consequential to wintering and/or dispersing Mexican spotted owl's use of these areas.

California Condor

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was chosen based on the potential foraging habitat that condors could use. There are approximately 25.71 miles of cliff habitat in the CEA. No cliff habitat is expected to be impacted by any past, present, or future federal action.

The habitat components with the greatest potential for cumulative effects include forest openings for foraging and larger diameter trees for nesting/roosting and perching. Large open park meadows do not exist within the project area but do exist in the CEA. Timber harvest activities may cause a reduction in the overall amount of suitable large trees in the CEA. However, given the design criteria protections for snag retention and recruitment, this cumulative effect would not likely be consequential to potential nesting/roosting California condors in this area, especially given that no condors have been documented using the project or CEA.

SENSITIVE WILDLIFE SPECIES

American Peregrine Falcon

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA encompasses all the 6th order HUCs surrounding the project area which represents an adequate potential foraging area that any peregrines near the project area may use.

Implementation of the Modified Proposed Action may add cumulatively to on-going and scheduled vegetation and road treatments associated with the Upper Valley and Birch Creek Riparian Improvement projects in the CEA area for the next 3-5 years with respect to possible short-term disturbance of foraging peregrine falcons during implementation of activities. This cumulative impact is expected to be minor to negligent given the distance to cliff habitat and known territories from these other projects. Implementation of the Modified Proposed Action

would produce a net improvement in upland, foraging habitat for this species by opening up areas further to foraging.

Flammulated Owl

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This area was selected as it best represents the available habitat found in the project area and impacts from the project are not likely to extend beyond this boundary.

A total of 806 acres of primary habitat and 316 acres of secondary habitat will be impacted by implementation of the Modified Proposed Action. Within the CEA area an additional 22,143 acres of primary habitat exists with an additional 8,087 acres of secondary habitat. The Modified Proposed Action will treat 29 percent of the total available primary habitat in the project area, but this represents only 3.64 percent across the CEA. The Modified Proposed Action will treat 100 percent of the available secondary habitat in the project area which represents approximately 3.91 percent of the secondary habitat in the CEA. This cumulative impact is designed to improve forested conditions over time to reverse the effects from past management.

Snags have the potential to be impacted with the Modified Proposed Action. This would add cumulatively to the past, on-going, and future vegetation projects in the CEA area. However, design criteria would maintain snag representation and promote future snag recruitment across the project area. This impact is expected to be minimal since snags are not targeted for treatment.

Northern Goshawk

The CEA for northern goshawk includes the home ranges for all three goshawk territories located in or partially within the project area, as well as a section of general goshawk foraging habitat not included in a known territory. These four areas total 23,317 acres but the actual acreage of the CEA is smaller due to overlapping territories and is approximately 18,919 acres. All goshawk home ranges affected by this project fall within this boundary. This area was selected as it best represents the most readily available habitat found in the project vicinity and impacts from the project are not likely to extend beyond this boundary.

The removal of overstory trees under the Modified Proposed Action would add cumulatively to past timber sale and fuels reduction operations located within the CEA area (i.e., Birch Creek Riparian and salvage sales from 30 plus years ago). There has been approximately 2,439 acres of vegetation activity within the CEA over the past 40 years. Some of these activities resulted in the dominant VSS 3 category found today. This project is designed to start to reverse this effect and move toward the desired condition for VSS.

Snags and downed wood are important structural components used by goshawk prey species. However, current snag densities will be maintained and down woody debris should increase over time across the project area with implementation of project design criteria. Some snag removal projects have occurred in the past in the form of sanitation/salvage harvest of approximately 221 acres. No sanitation/salvage has occurred in the past 20 years.

VSS distributions would be impacted with implementation of the Modified Proposed Action to some degree but this is expected to be a long-term process with multiple entries to reach desired condition for VSS. VSS distributions within the goshawk CEA area are found in Table 22 and are the average of VSS distributions in goshawk home ranges across the whole area. Past vegetation actions have contributed to the current VSS distribution by removing large trees through salvage, sanitation cuts, clear cuts, commercial thinning, shelterwood removals, and other actions targeting large trees. Implementing the Modified Proposed Action or Alternative 3 will do little to remedy the lack of VSS 5 and 6 in the CEA but will improve the trajectory of all VSS classes toward the desired condition.

Table 22. Approximate VSS distribution within the Goshawk CEA.

VSS	1	2	3	4	5	6
% in VSS	2.0%	0.67%	71.3%	24.0%	1.33%	2.67%

The cumulative impact associated with these projects and on-going and future projects are not expected to be major since habitat conditions are already degraded and project activities are designed to move toward the desired condition for VSS. Project design criteria for these projects are designed to maintain or enhance goshawk habitat in the long-term with reforestation efforts.

Spotted Bat and Townsend's Big-eared Bat

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was selected based on the distance that these bat species may travel for foraging from suitable roosting sites.

Project activities and timber sales associated with the Modified Proposed Action would add cumulatively to the past, ongoing, and planned future vegetation treatments for a net improvement in down wood recruitment, and an overall increase in vegetation diversity. Proposed vegetation treatments would create larger openings in existing burned area cover types. This would maintain and/or increase foraging opportunities for these bat species. In summary, implementation of the Modified Proposed Action, in tandem with other activities within the CEA, would result in a cumulative increase in foraging habitat for these two bat species.

Colorado River Cutthroat Trout

In terms of fisheries, the streams and watersheds of the CEA are very much changed from historical condition. Within the CEA, water diversion, road culverts, and other human-made structures, past vegetation management, wildfire, recreation, motorized travel, and livestock grazing have all impacted and may continue to impact fish and fish habitat under Alternative 2.

The effects of fire, livestock grazing, and roads on aquatic ecosystems are well documented. The direct and indirect effects of fire are discussed in the Dixie National Forest document "Effects of Fire on Fish and Aquatic Macroinvertebrates" (Robertson, S.R. 1997b), the direct and indirect effects livestock grazing are treated in "A Comprehensive literature review of the Effects of Livestock Grazing on Natural Resources" (USDA 1995), and the direct and indirect effects of

roads on fish and aquatic habitat are documented in (Furniss et al. 1991; Trombulak and Frissell 2000). These documents are hereby incorporated by reference.

Fire, livestock grazing, and roads all have the potential to increase erosion and thereby sediment transport and deposition (Furniss et al. 1991; Platts 1991; Trombulak and Frissell 2000). The number of motorized routes in the CEA should decline through implementation and enforcement of the Dixie MTP ROD. In 2012 and 2013 portions of that ROD were implemented within the CEA along with road drainage maintenance on FH 17; these actions should have resulted in a decrease in sediment entering streams and aquatic habitat within the project area and CEA. Alternative 2 would decommission routes classified as closed under the Dixie MTP ROD that are currently receiving use on the ground and would be used as temporary hauling routes in Alternative 3. Decommissioning these routes will result in a long-term reduction of sediment generation (Hydrology Specialist Report, Soils Specialist Report).

The Birch Creek Riparian Improvement Project was meant to increase ground cover and reduce sedimentation by promoting native riparian vegetation growth along streams within that project area. A flush of native woody species regeneration was seen immediately following treatment, but Riparian Level II inventory locations within that project will not be read again until 2017 (Figures 1 and 2).



Figure 1. Narrowleaf cottonwood regeneration along Hall Creek following implementation of the Birch Creek Riparian Improvement project.



Figure 2. Narrowleaf cottonwood regeneration along Hall Creek following implementation of the Birch Creek Riparian Improvement project.

Habitat fragmentation and the proliferation of nonnative fish species has been identified as one of the most influential factors restricting CRCT (CDW 2006a, 2006b). Remnant populations of CRCT still exist within the CEA and efforts are ongoing to maintain and expand CRCT populations. Active management by UDWR has established a conservation population in Twitchell Creek and may establish future conservation populations in Hall Creek above an existing natural barrier, Cherry Creek, and portions of North Creek have also been discussed as potential future reintroduction and restoration sites within the CEA.

The main impacts of Alternative 2 are increasing the potential for direct mortality from increased vehicle traffic during project activities and potential increased sediment generation and deposition into stream habitat. These potential impacts will not add cumulatively to effects from past, present, and reasonably foreseeable future activities to impact CRCT and their habitat in the CEA.

Boreal Toad

Similar to fish and fish habitat, aquatic habitat for amphibians within the CEA is very much changed from historical condition. Past vegetation management, wildfire, recreation, motorized travel, and livestock grazing have all impacted and may continue to impact amphibians and their habitat under the Alternative 2. As discussed above, the primary way these past and ongoing activities can impact amphibian habitat is through sediment generation. Similar to fish and fish habitat, amphibians and their habitat can also be negatively affected by increased erosion and sediment deposition. Amphibian densities have been shown to be significantly lower in streams

with higher sediment loads (Gillepsie 2002; Welsh, H. H. and Ollivier 1998). Sedimentation of open water areas can reduce their capacity to hold water and eventually lead to a reduction in open water habitat.

Amphibians in the CEA have also been exposed to several other factors that may have changed their distribution and abundance over historic levels. As highlighted in the Affected Environment, historical stocking efforts have established wild populations of nonnative brown trout, brook trout, rainbow trout, and cutthroat trout within the CEA. Nonnative trout introductions have been shown to negatively impact the diversity, abundance, and distribution of native amphibians, as well as potentially increase competition for food resources (Fellers and Drost 1993; Hecnar and M'Closkey 1997; Joseph et al. 2011; Knapp and Matthews 2000; Maxell 2000; Pilloid and Peterson 2001; Pope 2008; Tyler et al. 1998; Welsh, H.H. et al. 2006).

As mentioned under the Affected Environment, no boreal toads have ever been observed within the CEA and amphibian observations and lentic aquatic habitat within the CEA are sparse. Sediment generation from the actions proposed under the Modified Proposed Action could have small, short-term (project duration) impacts to potential boreal toad breeding and rearing habitat; however, the overall project will not add cumulatively to effects from past, present, and reasonably foreseeable future activities to impact amphibian habitat in the CEA.

WILDLIFE MANAGEMENT INDICATOR SPECIES

Mule Deer and Rocky Mountain Elk

The CEA chosen for these species is that portion of the Boulder Plateau/Kaiparowitz big game management unit designated by the Utah Division of Wildlife Resources found within the boundary of the 4 MTP Implementation Areas (IAs), encompassing approximately 153,122 acres. This CEA was selected based on habitat connectivity and the ability of mule deer and elk to move throughout this region depending on the time of year and food availability.

Implementation of the Modified Proposed Action may not add cumulatively to the most recent riparian treatment activity and future proposed activities (Upper Valley) to a further loss of hiding cover along roads and natural and created openings in the project areas given that hiding cover is currently lacking in the ponderosa pine type. Mixed conifer, pinyon and juniper, and spruce/fir cover types are not lacking in hiding cover at this time. This temporary loss of hiding cover in ponderosa pine includes some open roads within the CEA. Implementing the Modified Proposed Action will reduce it further in WUI, ponderosa pine improvement, and group selection patch cut units but impacts are short-term. Hiding cover in the long term would improve as patch cut stands regenerate and mechanical ponderosa pine regeneration matures. Therefore, implementation of the Modified Proposed Action would add cumulatively to a loss of hiding cover along roads and openings when considered with other vegetation removal projects in the short term within the CEA.

Habitat effectiveness will not measurably decrease cumulatively with implementation of the Modified Proposed Action and other vegetation actions in this area (e.g., Upper Valley and Birch Creek Riparian Treatment projects) since there are no proposed or ongoing roads proposals. Habitat effectiveness in the CEA area is expected to improve over the next few years as more MTP road obliteration and closure projects are implemented. Road densities within the project area under the Modified Proposed Action will increase up to 2.0 miles per square mile of habitat.

While this does diminish habitat effectiveness in the project area, big game species are wide ranging and use large amounts of area over the course of annual use patterns. Road densities for big game are more useful when looking at a larger area that includes summer, transitional, and winter range that big game would use. The road density currently in the big game CEA is 1.39 miles of road per square mile of habitat. Habitat effectiveness as it relates to roads and avoidance of roads for big game is functioning properly in this CEA and the addition of over 6 miles of roads with the Modified Proposed Action will only raise this to 1.42 miles of road per square mile of habitat.

Northern Flicker

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was selected to include suitable forested and woodland cover types found within the surrounding watersheds where past projects may have cumulative effects on this species.

Similarly to impacts to cavity nesters, with approximately 2,500 acres of the CEA experiencing some type of vegetation management activity in the past 20-30 years, the Modified Proposed Action will add cumulatively to these past activities, riparian treatments, and future planned treatments in contributing to a decrease in nesting and foraging habitat for flickers. This impact is less for flickers since they are more of a habitat generalist and forage on different insect species. Increases in down woody debris will increase foraging and nesting in the long term as insect habitat is improved and regenerated conifers are more healthy and insect and disease resistant.

Therefore, implementation of the Modified Proposed Action in the Mitchell Spring area would add cumulatively for a minor loss of roosting and foraging habitat for flickers within the CEA in the short term but would likely improve nesting and foraging long term.

Wild Turkey

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was selected to include the surrounding watersheds that have suitable roosting and foraging habitat.

Implementation of the Modified Proposed Action would add cumulatively to past timber sales and on-going and future riparian treatment projects for net loss in some roosting trees for this species. Therefore, implementation of the Modified Proposed Action in the project area would add cumulatively for a minor loss of roosting habitat for wild turkeys within the CEA. This impact is moderate since adequate roosting habitat will be retained and increased over the long-term.

Implementing the Modified Proposed Action will not impact forage conditions for turkey other than through displacement of birds using the area when activities are occurring.

Nonnative Trout

Since no direct or indirect impacts are expected to nonnative trout or their habitat under the Alternative 2, no cumulative effects are expected.

OTHER SPECIES OF CONCERN**Lewis's Woodpecker.**

The Cumulative Effects area for this species is the project area. This CEA was selected for this species based on the treatment of primary ponderosa pine habitat.

Implementation of the Modified Proposed Action would add cumulatively to past vegetation treatments in ponderosa pine when considering forest structure of primary ponderosa pine stands in the project area. Past projects have resulted in a project area that is dominated by mid-successional VSS 3 and 4 size class stands that do not reflect desired conditions for structural diversity. This project is designed to move this area toward the desired condition. Therefore, the cumulative impact from the Modified Proposed Action is more beneficial to future forest health that would benefit this and other migratory bird species.

Virginia's Warbler.

The CEA designated for this species is the project area. This CEA was selected for this species based on the minimal amount of primary mountain brush and pinyon and juniper habitat that will be impacted from project activities.

Implementation of the Modified Proposed Action would not add cumulatively to the past timber sales' and riparian improvement projects' pinyon and juniper removal since pinyon and juniper in the project area only occur as an understory species within the ponderosa pine cover type and the treatment is a ponderosa pine improvement treatment. Treatments are not located in pure stands of pinyon and juniper which is considered primary habitat for this species.

Direct disturbance from all ongoing and future activities on nesting warblers is possible in the form of displacement; this impact is expected to be minor due to available habitat adjacent to the CEA and project area where these birds can disperse into.

Black-throated Gray Warbler.

The CEA designated for this species is the project area. This CEA was selected for this species based on the minimal amount of primary pinyon and juniper habitat that will be impacted from project activities.

Implementation of the Modified Proposed Action would not add cumulatively to the past timber sales' and riparian improvement projects' pinyon and juniper removal since pinyon and juniper in the project area only occur as an understory species within the ponderosa pine cover type and the treatment is a ponderosa pine improvement treatment. Treatments are not located in pure stands of pinyon and juniper which is considered primary habitat for this species.

Direct disturbance from all ongoing and future activities on nesting warblers is possible in the form of displacement; this impact is expected to be minor due to available habitat adjacent to the CEA and project area where these birds can disperse into.

Gray Vireo

The CEA designated for this species is the project area. This CEA was selected for this species based on the minimal amount of primary pinyon and juniper habitat that will be impacted from project activities.

Implementation of the Modified Proposed Action would not add cumulatively to the past timber sales' and riparian improvement projects' pinyon and juniper removal since pinyon and juniper in the project area only occur as an understory species within the ponderosa pine cover type and the treatment is a ponderosa pine improvement treatment. Treatments are not located in pure stands of pinyon and juniper which is considered primary habitat for this species.

Direct disturbance from all ongoing and future activities on nesting vireos is possible in the form of displacement; this impact is expected to be minor due to available habitat adjacent to the CEA and project area where these birds can disperse into.

Broad-tailed Hummingbird

The CEA designated for this species is the project area. This CEA was selected for this species based on the minimal amount of primary habitat that will be impacted from project activities.

Implementation of the Modified Proposed Action would add cumulatively to the past timber sales and on-going and future riparian treatments for a short term loss of some primary and secondary nesting/foraging habitat for the broad-tailed hummingbird. Since primary habitat that occurs along riparian areas has design criteria outlined to help protect them, this impact is expected to be minimal. In addition, goshawk timing limitations that are implemented would help protect this species and secondary forested nesting habitat further during the breeding season.

Alternative 3

Direct and Indirect Effects

This alternative incorporates many of the actions proposed in the Modified Proposed Action alternative. Differences include: (1) no vegetation treatments occur in areas identified in Forest inventories as unroaded/undeveloped, particularly those in ponderosa stand improvement, Action 5, that occur south of FSR 30151; (2) no new temporary roads are constructed to facilitate vegetation treatments; (3) vegetation treatments are limited or prescriptions differ within designated goshawk Nest Areas (NA) and Post-fledgling Family Areas (PFA); (4) reforestation occurs without prescribed fire and/or mowing; microsite preparation would be done in the same manner as the current Modified Proposed Action; and (5) FSR 30151 is closed after treatments are completed, former FSR 30538 remains closed classified, and former FSR 30150 is designated for administrative use only. These actions are described in Chapter 2.

THREATENED AND ENDANGERED WILDLIFE SPECIES

Mexican Spotted Owl

In general, short-term (i.e., < 5 years) impacts to dispersing/wintering Mexican spotted owl habitat may occur with implementation of the Alternative 3. Group selection timber harvest, pinyon and juniper control, cottonwood and willow improvement, WUI treatments, and reforestation activities would occur during the day and would not directly affect this nocturnal species. However, burning activity fuels piles might extend into the evening hours and create a short term disturbance to the incidental use of the area by owls. This direct impact is expected to be minimal due to the lack of documented use of the area and the available dispersal habitat adjacent to the project area that will not be impacted. The project area is within dispersal distance from known breeding/roosting habitat; however, dispersing owls typically move to lower elevations up to 50 km from breeding/roosting habitat (Willey and Ward 2003). Also, there is no critical habitat or PACs within the project or CEA area.

Wintering/juvenile dispersal habitat components affected by project implementation include ground cover, large diameter trees, snags, and downed logs. In general, large diameter trees would decrease across the landscape, which is a long-term effect on habitat. Snags are not currently meeting desired condition in the ponderosa pine type but large green trees will be left to aid in future snag recruitment. Down woody debris would increase, on fewer acres than the Modified Proposed Action, as activity fuels accumulate, and ground cover would increase as more light hits the forest floor. Timber harvest with related impacts (large diameter tree loss, possible inadvertent or hazardous snag loss, increased down woody debris) would occur on up to 614 acres of the 4,313 acre project area in mixed conifer and ponderosa pine. This represents a change in habitat condition on approximately 14 percent of the project area which is considerably less than the 32 percent treated with the Modified Proposed Action. Other treatments such as the WUI, ponderosa pine improvement, and pinyon-juniper control will also remove overstory trees, although snags are not targeted. Removal of overstory trees could cause owls to use the habitat differently with the loss of perch trees since they are short perch and fly foragers. This impact is minimal due to the fact that plenty of perch trees will remain on the landscape.

Canopy cover, forested edge and openings, ground cover, and retention of large diameter trees are interrelated. As canopy cover reduces, more openings are created, changing or increasing edge and increasing light to the forest floor, which generally increases the quantity and diversity of ground cover. For this project, canopy cover would be reduced slightly in areas that are treated to create WUI and to control pinyon and juniper trees, or are thinned and canopy cover would be lost in areas that are patch clear cut. These clear cut areas are small 1-2 acre patch cuts spread out over the whole 433 acre group selection area. Harvest activities would impact current snag levels less than the Modified Proposed Action and prescriptions will provide for future snag recruitment from large diameter trees that will not be cut. In general, these conditions create better small mammal and bird habitat, which improves foraging opportunities for a variety of wildlife species including the Mexican spotted owl. Conversely, a decrease in large diameter trees would result in a reduction of cover and roosting sites for this species. Down woody debris is expected to increase with all actions of Alternative 3 since some activity fuels will be left on the ground. Down woody debris will still be below Forest Plan minimum guidelines but is increasing with this action albeit at a reduced amount when compared to the Modified Proposed

Action.

California Condor

Analysis of effects will be based on possible disturbance and alteration of potentially suitable nesting/foraging habitat.

The project area is located near 6.1 miles of cliff habitat located within 1 mile of the project boundary. There are 0.3 miles of cliff habitat located within the project boundary that is largely unsuitable for this species since these cliffs are not large enough to support nesting. California condors require relatively open habitats for foraging. Implementation of the proposed action would result in more open habitat structure especially in the group selection patch cut and reforestation area that includes site preparation. However, these openings are likely not large enough for condors to use. Condors have not been known to utilize the project area nor in the CEA.

Implementation of Alternative 3 may lead to a possible displacement of foraging condors due to implementation of project activities. The direct effect with this alternative is less than what may occur with the Modified Proposed Action since fewer acres would be treated. This direct effect is expected to be minimal since this area is not known to be utilized by condors and these birds are highly habituated to human's activities.

SENSITIVE WILDLIFE SPECIES

American Peregrine Falcon

There are no known peregrine territories in or near the project area, although suitable cliff habitat exists within 1 mile of the project boundary. It is possible that peregrine falcons would venture into the project area for foraging given that most foraging occurs within one mile of a nest area. If peregrine falcons were to use the area for foraging, there could be some direct impact due to displacement of foraging birds due to noise disturbance. This is expected to be minimal given the lack of documented use.

Vegetation treatments would open the treatment areas up and increase available sunlight resulting in a net increase in: (1) deciduous tree/shrub growth in the aspen type and (2) grass, forbs, and shrubs in the ponderosa pine and mixed conifer sites. The overall increase in vegetative diversity in the long term would likely increase diversity of prey species inhabiting these areas. Hence, the effects of treating these areas would result in a net improvement to potential peregrine falcon foraging habitat in the proposed treatment areas within 1.0 miles of suitable cliff habitat and near the three perennial stream corridors. This improvement is less than what would occur with the Modified Proposed Action since fewer acres would be treated.

Foraging peregrine falcons may be directly impacted through temporary displacement by Alternative 3 activities that occur during all seasons except winter. This direct impact would most likely occur with those activities located within 1 to 2 miles of rim habitat. All treatments are located within 1 mile of suitable rim habitat. Given the small likelihood of peregrine falcons using the project area, this direct impact is expected to be minor.

Flammulated Owl

In general, group selection logging, WUI treatment, pinyon and juniper control site preparation, reforestation, and pile burning or other project activities that occur during the late fall and winter months would not disturb this species. Activities that occur during the spring, summer, or early fall may directly impact nesting owls through displacement of foraging owls or nest abandonment due to noise and associated human disturbance and possible nest tree removal. Nesting could occur in the ponderosa pine, mixed conifer, and aspen stands (667 acres within Alternative 3 treatment units), although primary breeding is within ponderosa pine which comprises approximately 389 acres within treatment units. Spring pile burning may generate some smoke, but given this birds' tolerance to humans, it is unlikely that any birds would be displaced. Overall, disturbance due to project implementation would be minimal since use of the area by owls has been minimal and no owls were detected during project-specific surveys.

Some 667 acres of primary and secondary flammulated owl nesting and foraging habitat would be treated with the proposed action. Generally, basal area in most cover types would not change dramatically with Alternative 3 except within the 433 acres of group selection patch cuts which will reduce the basal area to 0 in the small 1-2 acre treatment areas. This impact will be less than what would occur with the Modified Proposed Action with 667 acres of treatment in Alternative 3 compared to 1,140 acres treated in the Modified Proposed Action. Leaving snags within the group selection harvest and reforestation treatment areas will help maintain some flammulated owl nesting habitat. Stem densities are reduced in all cover types and have dropped below tolerance levels for this species ((Goggans 1986) and (Bull et al. 1990) as reviewed in (McCallum 1994)). Reforestation is the same with this action as the Modified Proposed Action and will help recover basal area and stem density more quickly over the long-term than no action. Down wood would increase with implementation. Snags greater than 18" DBH should be maintained at 144 snags per 100 acres in the ponderosa pine type, and 1,400 snags per 100 acres in the mixed conifer type. However, there is the possibility of existing snags being removed for safety reasons or through inadvertent damage due to project activities. If this were to occur, it would be a negative indirect impact that would reduce nesting habitat quality in the short-term until other snags are recruited. Snags would be impacted in fewer numbers than what would occur with the Modified Proposed Action since fewer acres would be treated. This impact is expected to be minor since flammulated owls have not been documented using the area, they were not detected during project-specific surveys, and the relative size of the treatment area is small compared to the amount of adjacent habitat that will not be treated. Down wood debris recruitment would be diminished with this alternative when compared to the Modified Proposed Action and snags would be less likely to be impacted with this alternative when compared to the Modified Proposed Action.

Overall, understory vegetation diversity would increase in the long term. This would benefit flammulated owl prey species that utilize robust understory vegetation and adequate amounts of down woody debris.

Stand scale response to logging indicates that selective logging can create the open stand structure that "characterizes this owl's habitat everywhere it has been studied . . . as long as large old trees, open physiognomy, and some dense vegetation for roosting persists" (McCallum 1994). Planting will allow new stands to move through forest succession more rapidly than the No Action (natural regeneration). Following the reforestation activity, planted stands will

advance into the VSS 2 stage by approximately 2033, VSS 3 by 2053, and VSS 4 by 2153. Naturally regenerated stands would not likely hit VSS 2 until approximately 2063, VSS 3 by 2093 and VSS 4 by 2183 (Gustafson, 2015). This will be more beneficial to Flammulated owl foraging and nesting needs than leaving it in its current condition since owls prefer to nest and forage in diverse forested conditions as opposed to nesting and foraging in forested conditions that are dominated by a single age class of trees.

Northern Goshawk

In general, group selection timber harvest, pinyon and juniper control, cottonwood and willow improvement, WUI treatments, and reforestation activities would have the potential to disturb foraging or nesting northern goshawks that may be in the area if activities were to occur during spring and summer months.

Implementation of Alternative 3 would result in treatment of approximately 355 acres of suitable habitat within the Jake Hollow Foraging Area (FA) and 612 acres within the Hall Creek FA and an additional 138 acres of general FA habitat not tied directly to an existing territory. No treatments are proposed within the Under Barney territory. These figures are not exclusive in that some overlap of territory FAs exists so some acres that are treated in the Hall Creek territory are also treated and counted in the Jake Hollow territory. Approximately 355 acres are overlapping with both FA, meaning all treatment acres in the Jake Hollow FA are overlapping with Hall Creek FA.

Implementation of Alternative 3 would indirectly impact the Jake Hollow and Hall Creek goshawk territories post-fledgling areas (PFAs) and nest areas (NAs) through vegetation alteration including group selection timber harvest, WUI treatment, and pinyon-juniper tree control. No treatments are proposed within the Under Barney territory PFA or NA. Approximately 268 acres of the Jake Hollow's 1,396 acre PFA are proposed for treatment representing 19 percent of the PFA as compared to 32 percent with the Modified Proposed Action. No treatments are proposed within the NAs with this alternative. Approximately 242 acres of the Hall Creek's 563 acre PFA are proposed for treatment representing 43 percent of the PFA compared to 75 percent with the Modified Proposed Action. Over 242 acres of both PFAs are the same acres with overlapping PFAs and will not all be treated but will have numerous 1-2 acre clear-fell openings created within the larger area. Commercial thinning will occur in areas outside of these clear-fell areas down to approximately 90 square feet of basal area in the PFAs and 60 – 80 square feet of basal area outside of PFAs.

Alternative 3 would directly impact goshawks if they were present during project activities which could lead to displacement of birds using the area. Project design features exist to minimize direct disturbance to goshawks through timing restrictions if any territory is determined to be occupied.

Currently, VSS distributions within goshawk home ranges impacted by project activities are dominated by VSS 3. The VSS system is based on dominant size (diameter) of live trees. Because of this, the proposed group selection harvest and other treatments within the ponderosa pine cover type will not remove enough volume of any VSS class to change the VSS of most of the stands within the Jake Hollow territory (Gustafson 2015). However, early stand structure (VSS 1) and mid-to-late vegetation stand structure (VSS 4-5) would be achieved faster with

Alternative 3 than with the No Action due to clear-fell group selection harvest and other activities that open up forest canopies, thus reducing competition for resources and increasing growth rates. The VSS change is practically identical for Alternative 3 and the Modified Proposed Action due to the fact that most of the treatment areas are within overlap areas for both PFAs. The only difference is there would be less impact in NAs with Alternative 3 since these areas are excluded. The drawback is that these areas will not be improved over the long-term as with the Modified Proposed Action.

The VSS distribution within the FAs of the Hall Creek and Jake Hollow territories will change slightly with the proposed action. The group selection clear-fell areas would reduce VSS 3 representation from 66 percent in the Hall Creek territory to 60 percent, would increase VSS 1 representation from 0 to 5 percent, and increase VSS 5 representation by a modest 1.0 percent. The group selection clear fell areas would reduce VSS 3 representation by only 1.0 percent from 62 to 61 percent in the Jake Hollow territory with a corresponding increase of 1.0 percent in VSS 5 representation (1.0 percent to 2.0 percent), with a slight reduction of VSS 4 acres from 34 percent to 33 (Table 23). No VSS change is anticipated for the Under Barney territory since no proposed activities will occur. VSS distributions within goshawk home ranges will move toward the desired condition with implementation of the proposed action although desired condition will only be met after many entries over several decades.

Table 23. Current and Projected VSS within the Goshawk Home Ranges that occur within the Mitchell Spring Project Area with Alternative 3.

		VSS 1	VSS 2	VSS 3	VSS 4	VSS 5	VSS 6
Desired Condition		10%	10 %	20 %	20 %	20 %	20 %
Hall Creek Home Range (FA)	Current VSS	0%	0%	66.0%	28.0%	0%	5.0%
	Projected VSS	6.0%	0%	60.0%	28.0%	1.0%	5.0%
Jake Hollow Home Range (FA)	Current VSS	0%	1.0%	62.0%	34.0%	1.0%	3.0%
	Projected VSS	0%	1.0%	61.0%	33.0%	2.0%	3.0%
Under Barney Home Range (FA)	Current VSS	0%	1.0%	86.0%	10.0%	3.0%	0%
	Projected VSS	0%	1.0%	86.0%	10.0%	3.0%	0%

Alternative 3 will reduce canopy cover in the short-term due to group selection clear-fell treatments; however commercial thinning (promoting clumping and grouping of trees and reduced competition due to thinning of more densely stocked stands) will allow trees to grow more quickly than with no action. This will increase canopy cover in the long-term which is represented in the Stand Density Index (SDI). Since the canopy cover Forest Plan standard is for treatments designed to promote VSS 4, 5 and 6 stands, Alternative 3 moves the group selection

clear-fell areas closer to recommendations outlined in Standard H in the Goshawk Amendment (USDA 2000e) although at reduced acreage compared to the Modified Proposed Action.

Snags greater than 18" DBH should be maintained at 144 snags per 100 acres in the ponderosa pine type and 1,400 snags per 100 acres in the mixed conifer type. However, there is the possibility of existing snags being removed for safety reasons or through inadvertent damage due to project activities. If this were to occur, it would be a negative indirect impact that would reduce nesting habitat quality in the short-term until other snags are recruited. This impact is less than what could occur with the Modified Proposed Action. This impact is expected to be minor since goshawks have not been documented using the area, they were not detected during project-specific surveys, and the relative size of the treatment area is small compared to the amount of adjacent habitat that will not be treated.

Overall, potential foraging and nesting habitat would be improved for this species in the long term (5+ years) as trees mature and provide an array of VSS class vegetation and a net increase in preferred prey species habitat over time. Additionally, project design features (PDFs) in areas proposed for all treatments would maintain the recommended amounts of down wood and snags throughout the treatment area and, if snags are underrepresented, green trees will be left for future snag recruitment

Townsend's Big-eared Bat and Spotted Bat

In general, group selection timber harvest, pinyon and juniper control, cottonwood and willow improvement, WUI treatments, and reforestation activities would have the potential to alter foraging habitat within openings and along riparian areas. However, treatments as proposed are likely to improve foraging conditions by creating more open forested conditions. Activities that occur during the fall and winter months would not disturb these species which are likely hibernating in areas outside of the project area. Activities that occur during the spring, summer, or fall should not directly impact foraging bats since these activities occur during daylight hours. However, smoke that lingers through the night associated with spring pile burning might impact this species causing a short term displacement from the area. There is ample foraging habitat adjacent to the project area which both bat species could use that will not be impacted by smoke.

In summary, implementation of Alternative 3 would have a net beneficial impact on these two bat species due to creation of more open forested condition within riparian vegetation in the WUI treatment and increases in down woody debris that bat prey species utilize, which will improve overall foraging habitat for bats. This impact would be less for this alternative than what would be expected with the Modified Proposed Action, since fewer acres are being treated.

Colorado River Cutthroat Trout (CRCT)

Pinyon-Juniper Control

Effects to CRCT and fish habitat would be the same as under the Modified Proposed Action.

Ponderosa and Mixed Conifer Group Selection

Effects to CRCT and fish habitat under Alternative 3 would be similar but reduced when compared with the Alternative 2. Alternative 3 proposes 452 acres of group selection harvest compared to almost 771 acres in Alternative 2.

Artificial Reforestation with Site Preparation

The unit proposed for Artificial Reforestation with Site Preparation is over 550 feet away from the upper perennial portion of Birch Creek, so no direct impacts are expected to fish or fish habitat. No appreciable indirect impacts to CRCT or fish habitat are expected from the Artificial Reforestation with Site Preparation under Alternative 3.

Wildland Urban Interface Treatment

Effects to CRCT and fish habitat under Alternative 3 would be similar but reduced when compared with Alternative 2. Most notably, only 160 feet of Hall Creek and less than 40 feet of Water Canyon Creek would be overlapped by WUI treatments under Alternative 3, reducing the potential for, and magnitude of, direct and indirect impacts to CRCT and fish habitat in these streams.

Use of Roads and Update to the Transportation Plan

Effects to CRCT and fish habitat under Alternative 3 would be similar but reduced when compared with the Alternative 2. Sediment generation and delivery to Hall Creek would be lessened under Alternative 3, alleviating impacts to CRCT and CRCT habitat over both Alternative 2 and the existing condition.

Summary

Overall project activities proposed under Alternative 3 have the potential to directly impact CRCT and their habitat through increased use of low water crossings on FSR 30151 and FSR 33939. Increased traffic on system FSR 30151 related to thinning activities is expected to be minor, which should reduce any direct impacts to CRCT and their habitat; CRCT are not known to occupy Birch Creek as far upstream as the FSR 33939 crossing. Direct impacts from equipment use off of designated haul routes should be ameliorated by the use of SWCPs outlined in Appendix A of the Hydrology Specialist Report. Project activities have the potential to indirectly impact CRCT and their habitat by increasing sediment generation, reducing shading, and changing water quality. The reduced treatment area would reduce potential indirect impacts by moving treatments even further away from aquatic habitats and reducing additional use on haul routes. With the exception of the designation of unauthorized route G4092 as a temporary project road, these impacts should be ameliorated by SWCPs outlined in Appendix A to the Hydrology Specialist Report. The use of G4092 for project activities could negatively affect CRCT habitat through reduced shading, decreased bank stability, and increased sediment deposition. In order to protect CRCT habitat G4092 should not be used for project activities. Reclassifying the portions of FSR 30150 that would be opened to motorized use under Alternative 2 as Administrative Use Only in Alternative 3 following the completion project activities of would have a beneficial impact, as would closing FSR 30151.

Boreal Toad*Pinyon-Juniper Control*

Effects to amphibians and their habitat would be the same as under the Modified Proposed Action.

Ponderosa and Mixed Conifer Group Selection

Effects to boreal toad and amphibian habitat under Alternative 3 would be similar but reduced when compared with the Modified Proposed Action. Alternative 3 proposes 452 acres of group selection harvest compared to almost 771 acres in Alternative 2.

Artificial Reforestation with Site Preparation

Since no site preparation with prescribed fire or mowing is proposed under Alternative 3, the potential indirect impacts to the wetlands at the head of Birch Creek are reduced over Alternative 2.

Wildland Urban Interface Treatment

Effects to boreal toad and amphibian habitat under Alternative 3 would be similar but reduced when compared with the Modified Proposed Action.

Use of Roads and Update to the Transportation Plan

Effects to boreal toad habitat under Alternative 3 would be similar but reduced when compared with the Alternative 2.

Summary

Overall effects to boreal toad habitat under Alternative 3 would be similar but reduced when compared with the Modified Proposed Action.

WILDLIFE MANAGEMENT INDICATOR SPECIES**Mule Deer and Rocky Mountain Elk**

Vegetation treatments would result in a short-term displacement of mule deer and elk in the spring, summer, and early fall months. However, the area surrounding the project area offers good, alternative cover for displaced animals. Winter activities are not anticipated for this project and would not impact big game in years of high snow when big game would not likely be using the area. If activities were to occur during the winter months when snowpack is light, wintering big game could be impacted directly and cause short-term displacement and likely increased expenditure of energy.

Impacts to hiding and thermal cover will occur with all vegetation actions resulting in overstory tree removal or understory vegetation alteration. Vegetation conditions in the ponderosa pine type is likely not considered suitable cover capable of hiding 90 percent of a deer or elk at 200 feet at this time. This action may reduce this further, causing big game to utilize other areas for cover in the short term and beyond until young trees and shrubs are tall enough to contribute to

cover. This impact is less than what would occur with the Modified Proposed Action since fewer acres will be treated. Cover in the mixed conifer type is capable of hiding 90 percent of a deer or elk at 200 feet and will likely remain suitable cover following project activities.

The areas proposed for treatment in the project area are considered summer substantial and winter substantial habitat for elk. Alternative 3 will impact approximately 599 acres of summer substantial habitat out of 2,372 acres total or 25 percent and 151 acres of substantial winter habitat out of 1,941 acres total or 7.8 percent for elk. This is compared with 41 percent summer substantial and 28 percent winter substantial acres impacted with the Modified Proposed Action.

The areas proposed for treatment in the project area are considered summer substantial and winter crucial habitat for deer. Alternative 3 will impact approximately 599 acres of summer substantial out of 3,264 acres total or 18 percent and 151 acres of winter crucial habitat out of 1,049 acres total or 14 percent. This is compared with 32 percent summer substantial and 45 percent winter crucial acres impacted with the Modified Proposed Action. These impacts comprise a substantial amount of each habitat classification for deer and elk in the project area; however, taking into consideration the amount of total habitat within the greater CEA, the area treated is less than 3 percent for each habitat classification. Therefore, this impact is expected to be minimal in the short-term and will decrease further as vegetation becomes more established and deer and elk use increases.

There are a variety of dispersed recreation opportunities in the project area. Most of the road mileage existing in the project area is bordering ponderosa pine and mixed conifer habitats and accesses dispersed camping areas, high clearance vehicle recreation opportunities, and hunting areas. Currently there are approximately 7.18 miles of open roads and trails within the project area. No temporary roads are proposed to be used with this alternative. The temporary roads will be demolished and re-seeded following project activities.

Open road densities in the project area are currently 1.06 miles of road per square mile of habitat. Road densities in the project area would decrease from 1.06 to 1.0 miles of road per square mile of habitat with Alternative 3 since FSR 30151 will be closed from a motorized trail and FSR 30150 will be changed from closed to administrative resulting in a decrease of 0.4 miles. Question #2 of the Open Road Density Guideline (USDA 1998b) provides direction for assessing the scale at which the road density guideline should be applied. Road density calculations and impacts for this area are better addressed at the 2009 Forest wide Motorized Travel Plan (USDA 2009b) EIS Implementation Area (IA) level as opposed to the project area level. This is primarily a function of the recreation impact of the project area and also a function of the current condition of MTP implementation. No MTP action has occurred to physically close routes since the MTP decision in 2009, effectively making the current road density 2.43 miles of road per square mile of habitat. Administratively, these roads have been closed since 2009 on paper but not on the ground; any discussion of proposed project impacts from road density on deer and elk use patterns from what is proposed with this project is a reflection of the current condition and will improve to 1.94 miles of road per square mile of habitat once MTP is implemented. This would improve habitat effectiveness for deer and elk with an overall decrease in road density. Since big game are wide-ranging species, road densities reflected in the big game CEA (MTP IAs that the project intersects) are the appropriate scale to analyze and will be discussed in the cumulative effects section.

Northern Flicker

Implementation of vegetation treatments will result in a short-term displacement of northern flickers. Even though snags are abundant within the project area and will remain abundant post treatment, disruption of nesting birds will likely still occur. However, there is additional habitat available outside the Project Area for this species to use in the event of displacement.

Some 734 acres out of 4,245 total acres, or roughly 17.3 percent of total suitable habitat, would be affected with implementation of Alternative 3. This is compared to approximately 36 percent affected by the Modified Proposed Action. This impact is expected to be minimal given the large area surrounding the project area of suitable habitat that will not be impacted and also given the propensity of this species to be a habitat generalist that can move into any adjacent forested habitat and utilize these areas for nesting and foraging. In the short term, the removal of individual trees would reduce nesting and foraging opportunities for this species; however, snags would be maintained throughout the mixed conifer and ponderosa pine cover types, downed wood would increase, and vegetative diversity would increase in the long term. All of these structural components would maintain or improve habitat for flicker prey (insects) in the long term. Snags would be impacted less, down woody debris would accumulate at a reduced rate, and vegetative diversity would increase less with this alternative than with the Modified Proposed Action.

Impacts from human disturbance would occur with Alternative 3. Increased vehicular traffic (logging trucks, work trucks), heavy equipment operation, and pile burning with associated smoke would have the potential to displace foraging and nesting individuals for short periods of time. That displacement could result in nest failure or territory changes, or territory reductions while the activities occurred. Project design features in place for nesting goshawks could also protect this species and will help reduce direct impacts from project activities if goshawk territories were occupied or active. These design features will help reduce the possibility of take under the migratory bird treaty act and will help meet the intent of the MOU with the US Fish and Wildlife Service, as well as Executive Order 13186, which directs the Forest Service in meeting the intent of the MBTA.

Wild Turkey

Vegetation treatments would result in a short-term displacement of wild turkeys, which use the project area throughout the year for foraging, roosting, and cover. Displacement would be short term and there is abundant habitat outside of the Project Area for this species to use during project implementation.

There would be a short term reduction in cover (nesting), roosting, and associated foraging opportunities on 750 acres out of 4,278 suitable habitat acres with the implementation of Alternative 3. Roosting habitat would be reduced due to group selection clear-fell areas totaling approximately 448 acres with Alternative 3. Not all 448 acres will be treated but several 1-2 acre openings within this area will have all trees removed leaving plenty of roost trees remaining across this area. Foraging and nesting habitat is currently in good condition and is expected to improve as forested conditions become more open and down woody debris increases, which would lead to better habitat for insects and understory vegetation and nest habitat structure.

Nonnative Trout*Pinyon-Juniper Control*

No treatments are proposed in the Upper North Creek watershed; no effects are expected to nonnative trout or their habitat are expected.

Ponderosa and Mixed Conifer Group Selection

No treatments are proposed in the Upper North Creek watershed; no effects are expected to nonnative trout or their habitat are expected.

Artificial Reforestation with Site Preparation

No treatments are proposed in the Upper North Creek watershed; no effects are expected to nonnative trout or their habitat are expected.

Wildland Urban Interface Treatment

No treatments are proposed in the Upper North Creek watershed; no effects are expected to nonnative trout or their habitat are expected.

Use of Roads and Update to the Transportation Plan

No direct or indirect effects to fish or aquatic habitat are expected from reclassifying the portions of FSR 30150 and FSR 30538 within the Upper North Creek Watershed.

OTHER SPECIES OF CONCERN**Virginia's Warbler**

Alternative 3 may result in the unintentional take of individuals. However, the project complies with the US Fish and Wildlife Service Director's Order #131 related to applicability of the Migratory Bird Treaty Act to federal agencies and requirements for permits. In addition, these alternatives are compliant with the Executive Order 13186 (Federal Register 2001a), because the analysis meets our obligation as defined under the Memorandum of Understanding and, specifically, because suitable habitat surrounding habitat impacted from project activities is available to these bird species to disperse to and use. Project design features in place for nesting goshawks would also protect this species and will help reduce direct impacts from project activities due to timing limitations restricting activities that will occur during these species breeding seasons as long as goshawk territories are active or occupied.

Implementation of the pinyon and juniper removal treatments on approximately 30 acres of secondary pinyon-juniper habitat within the 4,332 acre project area could result in the displacement of Virginia's warblers using the pinyon-juniper areas within the project area. This is expected to be a minor impact since their primary habitat is mountain shrub habitat, with secondary habitat being more established pinyon-juniper stands that are older and more likely in a Phase II or III classification as opposed to smaller trees encroaching into ponderosa pine.

Lewis's Woodpecker

Vegetation treatments that occur during the fall, winter, and early spring months (September-March) will have little to no direct impacts to migratory bird species. Migratory birds may be indirectly impacted from project activities that occur during the non-nesting season through loss of habitat and possible past nest tree removal. Vegetation treatments that occur during the late spring and summer months will directly impact migratory birds, including the Lewis's woodpecker, due to noise, smoke, and dust generated by project activities.

Snags greater than 18" DBH should be maintained at 144 snags per 100 acres in the ponderosa pine type, and 1,400 snags per 100 acres in the mixed conifer type. However, there is the possibility of existing snags being removed for safety reasons or through inadvertent damage due to project activities. This impact is expected to be less than what would occur with the Modified Proposed Action due to fewer acres being treated. If impacts were to occur, it would be a negative indirect impact that would reduce nesting habitat quality in the short-term until other snags are recruited. This impact is expected to be minor since Lewis's woodpecker have not been documented using the area, they were not detected during project specific surveys, and the relative size of the treatment area is small compared to the amount of adjacent habitat that will not be treated.

Impacts from habitat loss in primary breeding habitat (ponderosa pine) is expected to occur as group selection clear-fell treatments are applied, thus removing overstory trees utilized for perching, foraging, and possibly nesting if snags are removed. This impact is long-term but is offset by the fact that overall health of these stands is improved with a move toward desired condition VSS distribution, thus adding diversity and removing competition from overstocked stands leading to more healthy trees over time.

Black-throated Gray Warbler

Implementation of the pinyon and juniper removal treatments on approximately 30 acres within the ponderosa pine cover type within the 4,332 acre project area could result in the displacement of black-throated gray warblers using the pinyon-juniper areas within the project area. This is expected to be a minor impact since their primary habitat is more established pinyon-juniper stands that are older and more likely in a Phase II or III classification as opposed to smaller trees encroaching into ponderosa pine.

Gray Vireo

Implementation of the pinyon and juniper removal treatments on approximately 30 acres within the ponderosa pine cover type within the 4,332 acre project area could result in the displacement of gray vireo using the pinyon-juniper areas within the project area. This is expected to be a minor impact since their primary habitat is more established pinyon-juniper stands that are older and more likely in a Phase II or III classification as opposed to smaller trees encroaching into ponderosa pine.

Broad-tailed Hummingbird

Vegetation treatments that occur during the fall, winter, and early spring months (September-March) will have little to no direct impacts to migratory bird species. Migratory birds may be

indirectly impacted from project activities that occur during the non-nesting season through loss of habitat and possible nest tree removal. Vegetation treatments that occur during the late spring and summer months will directly impact migratory birds, including the broad-tailed hummingbird due to noise, smoke, and dust generated by project activities—as well as the possibility that some early spring nests might be destroyed in the process of implementing some activities, including slash management/pile burning. Given that some of these treatments could occur during the fall and winter months, disturbance impacts to broad-tailed hummingbird and other bird species are expected to be short term, indirect, and limited on these acres.

Impacts from habitat loss in primary breeding habitat (mountain riparian) is expected to occur given that some treatments such as WUI are expected to occur near perennial streams as are other treatments. There are 3 perennial streams in the project area that are primary habitat for this species. However, the overall impact to hummingbirds is expected to be minimal to non-existent due to the PDFs that buffer and protect streams.

Cumulative Effects

THREATENED AND ENDANGERED SPECIES

Mexican Spotted Owl

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was chosen based on this species potential winter juvenile migration patterns from the Capital Reef National Park and Grand Staircase/Escalante areas to the project area.

The habitat component with the greatest potential for cumulative effects includes snags and down logs. The effects of timber sales, fire suppression, recreational uses (especially firewood cutting), and camping have all contributed to loss of snags and down logs. However, snag densities are currently above Forest Plan minimums across the CEA area in mixed conifer cover type due to insects that have contributed to mortality of Douglas fir. Snag densities are low in the ponderosa pine cover type due to past timber harvest in the 1980s that occurred as a result of localized outbreak of mountain pine beetles. Implementing Alternative 3 may decrease snag densities across the CEA moving this trend downward although to a lesser degree than with the Modified Proposed Action. Snags that are left following project activities may fall over within a few years due to windthrow; this effect could be cumulative with other vegetation treatments. Down woody debris is lacking across the CEA in ponderosa pine and this action will increase down woody component.

Closing roads with the Forest-wide Access Management Plan would help reduce areas that are easily accessible to woodcutting. However, given the low density of dead trees across the CEA as well as the low likelihood of the public wanting to cut dead trees in the project or CEA due to low numbers, these cumulative effects would not likely be consequential to wintering and/or dispersing Mexican spotted owl's use of these areas.

California Condor

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres.

This CEA was chosen based on the potential foraging habitat that condors could use. There are approximately 25.71 miles of cliff habitat in the CEA. No cliff habitat is expected to be impacted by any past, present, or future federal action.

The habitat components with the greatest potential for cumulative effects include forest openings for foraging and larger diameter trees for nesting/roosting and perching. Large open park meadows do not exist within the project area but do exist in the CEA. Timber harvest activities will cause a reduction in the overall amount of suitable large trees in the CEA but to a lesser degree than with the Modified Proposed Action since there are over 300 fewer group selection patch cut acres treated with Alternative 3. However, given the design criteria protections for snag retention and recruitment, this cumulative effect would not likely be consequential to potential nesting/roosting California condors in this area, especially given that no condors have been documented using the project or CEA.

SENSITIVE WILDLIFE SPECIES

American Peregrine Falcon

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA encompasses all the 6th order HUCs surrounding the project area which represents an adequate potential foraging area that any peregrines near the project area may use.

Implementation of the Modified Proposed Action may add cumulatively to possible road treatments associated with the MTP project in the CEA area for the next 3-5 years with respect to possible short-term disturbance of foraging peregrine falcons during implementation of activities. This cumulative impact is expected to be minor to negligent given the distance to cliff habitat and known territories from these other projects. Implementation of Alternative 3 would not produce a net improvement in upland, foraging habitat for this species since 1-2 acre openings are not considered to be large enough to provide suitable foraging habitat.

Flammulated Owl

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This area was selected as it best represents the available habitat found in the project area and impacts from the project are not likely to extend beyond this boundary.

A total of 389 acres of primary habitat and 278 acres of secondary habitat will be impacted with the implementation of the proposed action. Within the CEA area an additional 22,143 acres of primary habitat exists, with an additional 8,087 acres of secondary habitat. Alternative 3 will treat 14 percent of the total available primary habitat in the project area, but this represents only 1.76 percent across the CEA. The proposed action will treat 100 percent of the available secondary habitat in the project area which represents approximately 3.43 percent of the secondary habitat in the CEA. This cumulative impact is designed to improve forested conditions over time to reverse the effects from past management.

Snags have the potential to be impacted with Alternative 3 implementation. This would add cumulatively to the past, on-going, and future vegetation projects in the CEA area. However,

design criteria would maintain snag representation and promote future snag recruitment across the project area. This impact is expected to be minimal since snags are not targeted for treatment.

Northern Goshawk

The CEA for northern goshawk includes the home ranges for all three goshawk territories located in or partially within the project area as well as a section of general goshawk foraging habitat not included in a known territory. These four areas total 23,317 acres but the actual acreage of the CEA is smaller due to overlapping territories and is approximately 18,919 acres. All goshawk home ranges affected by this project fall within this boundary. This area was selected as it best represents the most readily available habitat found in the project vicinity and impacts from the project are not likely to extend beyond this boundary.

The removal of overstory trees under the proposed action would add cumulatively to past timber sale and fuels reduction operations located within the CEA area (i.e., Birch Creek Riparian and salvage sales from 30 plus years ago). There has been approximately 2,439 acres of vegetation activity within the CEA over the past 40 years. Some of these activities resulted in the dominant VSS 3 category found today. This project is designed to start to reverse this effect and move toward the desired condition for VSS.

Snags and downed wood are important structural components used by goshawk prey species. However, current snag densities will be maintained and down woody debris should increase over time across the project area with implementation of project design criteria. Some snag removal projects have occurred in the past in the form of sanitation/salvage harvest of approximately 221 acres. No sanitation/salvage has occurred in the past 20 years.

VSS distributions would be impacted with implementation of Alternative 3 to some degree but this is expected to be a long-term process with multiple entries to reach desired condition for VSS. VSS distributions within the goshawk CEA area as a result of Alternative 3 are found in Table 24 and are the average of VSS distributions in goshawk home ranges across the whole area. These distributions are the same as that found with the Modified Proposed Action due to complete overlap of the Jake Hollow territory with Hall Creek. Past vegetation actions have contributed to the current VSS distribution by removing large trees through salvage, sanitation cuts, clear cuts, commercial thinning, shelterwood removals, and other actions targeting large trees. Implementing the Modified Proposed Action or Alternative 3 will do little to remedy the lack of VSS 5 and 6 in the CEA but will improve the trajectory of all VSS classes toward the desired condition.

Table 24. Approximate VSS distribution within the Goshawk CEA from Alternative 3.

VSS	1	2	3	4	5	6
% in VSS	2.0%	0.67%	71.3%	24.0%	1.33%	2.67%

The cumulative impact associated with these projects and on-going and future projects are not expected to be major since habitat conditions are already degraded and project activities are

intended to move toward the desired condition for VSS. Project design criteria for these projects are designed to maintain or enhance goshawk habitat in the long-term with reforestation efforts.

Spotted Bat and Townsend's Big-eared Bat

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was selected based on the distance that these bat species may travel for foraging from suitable roosting sites.

Project activities and timber sales associated with Alternative 3 would add cumulatively to the past, ongoing, and planned future vegetation treatments for a net improvement in down wood recruitment, and an overall increase in vegetation diversity. Proposed vegetation treatments would create openings in ponderosa pine and mixed conifer cover types. This would maintain and/or increase foraging opportunities for these bat species. In summary, implementation of Alternative 3 in tandem with other activities within the CEA would result in a cumulative improvement in foraging habitat conditions for these two bat species.

Colorado River Cutthroat Trout

With the exception of changes to the proposed activities outlined in Alternative 3, impacts from past, present, and reasonably foreseeable future projects are the same as in the Modified Proposed Action. Direct and indirect impacts under Alternative 3 are similar but reduced when compared to Alternative 2. Reclassifying FSR 30151 from an open route to a closed route under Alternative 3 may interact cumulatively with the recent riparian treatments along Hall Creek and the Hall Creek culvert replacement to improve habitat for CRCT in the lower portions of Hall Creek.

Boreal Toad

With the exception of changes to the proposed activities outlined in Alternative 3, impacts from past, present, and reasonably foreseeable future projects are the same as the Modified Proposed Action. Direct and indirect impacts under Alternative 3 are similar but reduced when compared to Alternative 2. Reclassifying FSR 30151 from an open route to a closed route under Alternative 3 may interact cumulatively with the recent riparian treatments along Hall Creek and the Hall Creek culvert replacement to improve aquatic habitat.

WILDLIFE MANAGEMENT INDICATOR SPECIES

Mule Deer and Rocky Mountain Elk

The CEA chosen for these species is that portion of the Boulder Plateau/Kaiparowitz big game management unit designated by the Utah Division of Wildlife Resources found within the boundary of the 4 MTP Implementation Areas (IAs), encompassing approximately 153,122 acres. This CEA was selected based on habitat connectivity and the ability of mule deer and elk to move throughout this region depending on the time of year and food availability.

Implementation of Alternative 3 may not add cumulatively to the most recent riparian treatment activity and future proposed activities (Upper Valley) to a further loss of hiding cover along

roads and natural and created openings in the project areas given that hiding cover is currently lacking in the ponderosa pine type. Mixed conifer, pinyon and juniper, and spruce/fir cover types are not lacking in hiding cover at this time. This temporary loss of hiding cover in ponderosa pine includes some open roads within the CEA. Implementing the proposed action will reduce it further in WUI, ponderosa pine improvement, and group selection patch cut units but impacts are short-term. Hiding cover in the long term would improve as patch cut stands regenerate and mechanical ponderosa pine regeneration matures. Therefore, implementation of Alternative 3 would add cumulatively to a loss of hiding cover along roads and openings when considered with other vegetation removal projects in the short term within the CEA.

Habitat effectiveness will not measurably decrease cumulatively with implementation of the proposed action and other vegetation actions in this area (e.g., Upper Valley and Birch Creek Riparian Improvement projects) since there are no proposed or ongoing roads proposals. Habitat effectiveness in the CEA area is expected to improve over the next few years as more MTP road obliteration and closure projects are implemented. Road densities within the project area under Alternative 3 will decrease. Road density calculations for big game are most useful when looking at a larger area that includes summer, transitional, and winter range that big game would use. The road density currently in the big game CEA is 1.39 miles of road per square mile of habitat. Habitat effectiveness as it relates to roads and avoidance of roads for big game is functioning properly in this CEA and the closure of over 4 miles of roads with Alternative 3 will decrease this to 1.36 miles of road per square mile of habitat.

Northern Flicker

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was selected to include suitable forested and woodland cover types found within the surrounding watersheds where past projects may have cumulative effects on this species.

Similarly to impacts to cavity nesters, with approximately 2,500 acres of the CEA experiencing some type of vegetation management activity in the past 20-30 years, implementing Alternative 3 will add cumulatively to these past activities, riparian treatments, and future planned treatments (including this project and the Upper Valley project) in contributing to a decrease in nesting and foraging habitat for flickers. This impact is less for flickers since they are more of a habitat generalist and forage on different insect species. Increases in down woody debris will increase foraging and nesting in the long term as insect habitat is improved and regenerated conifers are more healthy and insect and disease resistant.

Therefore, implementation of Alternative 3 in the Mitchell Spring area would add cumulatively for a minor loss of roosting and foraging habitat for flickers within the CEA in the short term but would likely improve nesting and foraging long term.

Wild Turkey

The CEA designated for this species is the Upper North Creek, Lower North Creek, Birch Creek, and Sweetwater Creek 6th order HUC watersheds encompassing approximately 108,172 acres. This CEA was selected to include the surrounding watersheds that have suitable roosting and foraging habitat.

Implementation of Alternative 3 would add cumulatively to past timber sales and on-going and future riparian treatment projects for net loss in some roosting trees for this species, although at a lower level than what would occur with the Modified Proposed Action. Therefore, implementation of Alternative 3 in the project area would add cumulatively for a minor loss of roosting habitat for wild turkeys within the CEA. This impact is minor since adequate roosting habitat will be retained and increased over the long-term and forest health will be improved over time.

Implementing Alternative 3 will not impact forage conditions for turkey from this and other ongoing activities other than through displacement of birds using the area when activities are occurring. This impact is expected to be minor since these activities are separated by time and space across the CEA.

Nonnative Trout

Since no direct or indirect impacts are expected to nonnative trout or their habitat under the Alternative 3, no cumulative effects are expected.

OTHER SPECIES OF CONCERN

Lewis's Woodpecker.

The Cumulative Effects area for this species is the project area. This CEA was selected for this species based on the treatment of primary ponderosa pine habitat.

Implementation of Alternative 3 would add cumulatively to past vegetation treatments in ponderosa pine when considering forest structure of primary ponderosa pine stands in the project area. Past projects have resulted in a project area that is dominated by mid-successional VSS 3 and 4 size class stands that do not reflect desired conditions for structural diversity. This project is designed to move this area toward the desired condition although less so with this alternative than with the Modified Proposed Action. Therefore, the cumulative impact from Alternative 3 is more beneficial to future forest health that would benefit this and other migratory bird species.

Virginia's Warbler.

The CEA designated for this species is the project area. This CEA was selected for this species based on the minimal amount of primary mountain brush and pinyon and juniper habitat that will be impacted from project activities.

Implementation of Alternative 3 would not add cumulatively to the past timber sales' and riparian improvement projects' pinyon and juniper removal since pinyon and juniper in the project area only occur as an understory species within the ponderosa pine cover type and the treatment is a ponderosa pine improvement treatment. Treatments are not located in pure stands of pinyon and juniper which is considered primary habitat for this species.

Direct disturbance from all ongoing and future activities on nesting warblers is possible in the form of displacement but this impact is expected to be minor due to available habitat adjacent to the CEA and project area where these birds can disperse into.

Black-throated Gray Warbler.

The CEA designated for this species is the project area. This CEA was selected for this species based on the minimal amount of primary pinyon and juniper habitat that will be impacted from project activities.

Implementation of Alternative 3 would not add cumulatively to the past timber sales' and riparian improvement projects' impacts on pinyon and juniper removal since pinyon and juniper in the project area only occur as an understory species within the ponderosa pine cover type and the treatment is a ponderosa pine improvement treatment. Treatments are not located in pure stands of pinyon and juniper which is considered primary habitat for this species. These treatments are not located in pure stands of pinyon and juniper which is more suitable habitat for this species.

Direct disturbance from all ongoing and future activities on nesting warblers is possible in the form of displacement but this impact is expected to be minor due to available habitat adjacent to the CEA and project area where these birds can disperse into.

Gray Vireo

The CEA designated for this species is the project area. This CEA was selected for this species based on the minimal amount of primary pinyon and juniper habitat that will be impacted from project activities.

Implementation of Alternative 3 would not add cumulatively to the past timber sales' and riparian improvement projects' impacts on pinyon and juniper removal since the occurrence of these tree species in the project area is within the ponderosa pine cover type which is proposed to receive a ponderosa pine improvement treatment. These treatments are not located in pure stands of pinyon and juniper which is more suitable habitat for this species.

Direct disturbance from all ongoing and future activities on nesting vireos is possible in the form of displacement but this impact is expected to be minor due to available habitat adjacent to the CEA and project area where these birds can disperse into.

Broad-tailed Hummingbird

The CEA designated for this species is the project area. This CEA was selected for this species based on the minimal amount of primary habitat that will be impacted from project activities.

Implementation of Alternative 3 would add cumulatively to the past timber sales and on-going and future riparian treatments for a short term loss of some primary and secondary nesting/foraging habitat for the broad-tailed hummingbird. Since primary habitat that occurs along riparian areas has design criteria outlined to help protect them, this impact is expected to be minimal. In addition, goshawk timing limitations that are implemented would help protect this species and secondary forested nesting habitat further during the breeding season.

Summary of Effects

A summary of the effects on terrestrial wildlife/plant species and their habitat analyzed for the Escalante Ranger District Mitchell Spring Vegetation Improvement Project is provided in Table 25. Determinations for CRCT, boreal toad, and nonnative trout assume that the PDFs, BMPs, and SWCPs specified in Appendix A to the Hydrology Specialist Report will be incorporated into the Selected Alternative and the Decision for the Mitchell Spring Vegetation Improvement Project and that route G4092 will not be used as a temporary road for project activities.

Table 25. Summary of determinations of direct, indirect, and cumulative effects and rationale for Wildlife Resources - Threatened, Endangered, Sensitive, Management Indicator, and Other Species of Concern –All Alternatives– Escalante Ranger District Mitchell Spring Vegetation Improvement Project.

Species (Common Name)		Determinations ¹		
		Modified Proposed Action	Alternative 3	No Action
TES	Mexican Spotted Owl	May Affect, but Not Likely to Adversely Affect	May Affect, but Not Likely to Adversely Affect	No Effect
	California Condor	Will Not Jeopardize this Experimental, Non-Essential Population	Will Not Jeopardize this Experimental, Non-Essential Population	No Effect
Intermountain Regional Forester's Sensitive Species	Peregrine Falcon	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.	No Impact
	Flammulated Owl	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.	No impact
	Northern Goshawk	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species. Beneficial Impact	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species. Beneficial Impact	No impact
	Spotted Bat / Townsend's Big-eared Bat	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.	No impact
	Colorado River Cutthroat Trout	May impact individuals or habitat, but will not likely contribute to a trend toward	May impact individuals or habitat, but will not likely contribute to a trend toward	No impact

		Federal listing or cause a loss of viability to the population or species.	Federal listing or cause a loss of viability to the population or species.	
	Boreal Toad	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.	May impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.	No impact
MIS	Mule Deer / Rocky Mountain Elk	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	No impact
	Northern Flicker	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	No impact
	Wild Turkey	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	No impact
	Nonnative Trout	No impact	No impact	No impact
Other Species of Concern	Lewis's Woodpecker	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	No impact
	Virginia's Warbler	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	No impact
	Black-throated Gray Warbler	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	No impact
	Gray Vireo	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	No impact
	Broad-tailed Humming-bird	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	May impact individuals or habitat, but will not cause a loss of viability to the population or species. Viable populations maintained.	No impact

¹ Determination refers to the term used in assessing project effects to threatened, endangered, proposed or sensitive species. Conclusions are statements used to assess project impacts to Management Indicator or Other Species of Concern.

FIRE, FUELS, AND AIR QUALITY RESOURCE

Introduction

This section presents a summary of the Fire and Fuels Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Fire and Fuels Specialist Report contained in the project record. Included in this section are summaries of the affected environment and environmental consequences of each of the three alternative actions described in Chapter 2.

Affected Environment

The Mitchell Spring Vegetation Improvement Project (MSVIP) area is located within the Escalante Ranger District of the Dixie National Forest and consists of a total of 4,313 acres. The analysis area is located in T34S R1E Sections 17-20, 30-33, T34S R1W Sections 13, 14, 22-27, and T35S R1E, Sections: 4, 5.

Due to fire suppression and other management practices, the MSVIP area has fire and fuels conditions outside of the historical range of variability. Currently large portions of the project area are made up of continuous areas of tight crown spacing and significant ladder fuels. These conditions are increasing the vulnerability of the area to large, high severity fires that have the potential to harm wildlife, plant communities, fisheries, ecological processes, and watershed health. In addition, any future ignitions in this area that occur during hot, dry, and windy conditions are likely to burn large portions of the watershed. Continuous fuels hamper suppression efforts in this area and increase risk to firefighting forces and the public.

Under ideal circumstances natural fire or human-caused fire occurring within the MSVIP area would not result in major resource damage or negative impacts to wildlife habitat, streams, livestock range, recreation opportunities, and old growth timber. However, currently much of the MSVIP analysis area would support rapid fire growth with a high probability of damaging and/or negatively impacting those resources under hot and dry and/or windy conditions. In addition, large uncontrolled wildfires can significantly reduce air quality in the area immediately surrounding the fire and downwind for the duration of the fire.

It is estimated that historically fires occurred with more frequency and grew larger in the MSVIP area than what is currently allowed to occur. Yet, due to the increased frequency, these fires were lower intensity and did not result in as much resource damage as unplanned fires now cause. This is due in part to the practice of full fire suppression over the last 100+ years. By suppressing wildfire the amount of trees per acre has increased and canopy base height has decreased in most areas. Ladder fuels such as mature brush stands, and developing understory trees like pinyon, juniper, and white fir have increased and some desirable grasses and forbs have decreased in coverage. All of this contributes to a higher probability of large scale resource damaging wildfire.

Environmental Consequences

This section focuses on the fuels and the probability of large scale, resource damaging fire in the various identified vegetation classes within the MSVIP. Current vegetation and fuels conditions vary within the analysis area.

The MSVIP area consists of the east slopes of the Table Cliff Plateau in the Birch Creek watershed in the Escalante Ranger District of the Dixie National Forest. Primary fuels consist of: (1) low elevation vegetation with some areas of sage brush/rabbit brush openings; mature pinyon-juniper with limited ground fuels sufficient of carrying a ground fire; and pinyon-juniper areas with sufficient mountain brush (sagebrush, oak, bitterbrush, and rabbit brush) to carry fire intermittently scattered throughout the stands on the lower elevation slopes; (2) mid-elevation vegetation consists of a ponderosa pine overstory with bitterbrush, oak, and manzanita brush understory (much of the ponderosa pine in the MSVIP area also has some fir and pinyon / juniper encroachment in the understory); and (3) higher elevation vegetation consisting of mixed conifer, Engelmann spruce, and subalpine fir. The project area abuts private land inholdings along the Main Canyon road with the Main Canyon/Davis Point community identified as a community at risk (Federal Register 2001b). The entire project area has missed at least one fire return interval putting the project area outside the historic range of variability.

As time goes on, the forests and shrublands in the MSVIP area will become further removed from the historic fire return interval. Previous treatments in the project area include timber harvest, wildfire, rangeland improvements, or other that have helped slow the departure from normal or pre Anglo-American settlement levels. Cumulatively the average FRCC (see p. 10) for the MSVIP area is averaged at a 2, meaning the forests and shrublands have missed at least one fire return interval. Throughout the MSVIP area, both modeled and observed fire behavior is outside of the range of variability for what would occur historically. Large scale fires, that have a negative impact, are more likely to occur than in the past. An example of this is the 2008 Corn Creek Fire.

Alternative 1 (No Action)

Under the No Action Alternative the potential for large scale resource damaging fire will increase due to increased ladder fuels, higher stand density, increased fuel loads, and an even aged stand structure. The potential for large scale crown fire will increase. Smoke output during a wildfire will increase and air quality will decrease downwind and in the immediate area. Threat to public and firefighter safety during a wildfire event will increase and the MSVIP area will become further removed from a fire return interval within historic ranges of variability.

Alternative 2 (Modified Proposed Action)

The effects of Alternative 2 will be broken down by vegetation type and proposed actions.

Action 1: (Pinyon-Juniper Control). Removal of pinyon and juniper from shrublands will reduce negative fire effects and fuel loadings and improve the safety of personnel and public in the event of a wildfire. Though most fire behaviors will change little with the Modified Proposed Action, removing conifer from shrublands reduces spotting distances and flame lengths from a wildfire.

Action 2: (Ponderosa and Mixed Conifer Group Selection). The proposed treatments in the mixed conifer show an increase in fire behavior such as flame lengths and rates of spread. However, the increased canopy spacing and reduction in ladder fuels results in reduced likelihood of a fire transitioning to a crown fire. Ground resources will be able to contain a fire in most circumstances post treatment in the mixed conifer.

In the ponderosa pine stands treated in Action 2 the modeled differences between pre- and post-treatment are more significant. During hot and dry conditions fire behavior is significantly reduced as compared to pre-treatment models. Unwanted ladder fuels and low canopy base heights are improved through the treatment which results in fire behavior more likely to benefit the vegetation and more manageable for firefighting resources.

Action 3: (Artificial Reforestation with Site Preparation). Either of the treatments proposed in Action 3 will reduce fire behavior and reduce the risk to firefighters and the public in the event of a wildfire. A combination of mowing and burning would be the most effective for improving safety and reducing the potential for negative effects of fire on the proposed treatment area.

Action 4: (Ponderosa Pine Stand Improvement). This treatment has a positive effect in reducing crown fire potential in the ponderosa pine in that it lowers ladder fuels and increases crown spacing between trees making a crown fire less likely. However the increased fuel loading in a large portion of the treatment area leads to increased ground flame lengths and rates of spread. The increased ground fuel loading shows a negative effect to the stand. Firefighter and public safety may also be negatively impacted in the event of a wildfire in the treatment area. The area along the road that will be cut and piled will reduce negative fire effects in that area; and that area along with the road will serve as fuel break.

Action 5: A shaded fuel break around the private lands in Main Canyon would serve to break up the continuity of fuels along and near the property boundary between Forest Service and private lands; this would reduce the likelihood of a fire crossing the property boundary and give firefighting personnel the ability to use direct attack methods to contain a wildfire in the fuel break. In addition, the increase in crown spacing and reduction of ladder fuels would reduce the potential for crown fire and a crown fire would transition to a surface fire in the shaded fuel break in all but the worst weather conditions.

Action 6: (Use of Roads and Update to the Transportation Plan). Some of the proposed temporary roads may act as fuel breaks and access points in the event of a wildfire while in use and for some time after, but overall both positive and negative effects from temporary roads are negligible.

Reclassifying FSR 30150 and FSR 30538 as open allows for improved detection and reductions in response times for fire personnel in the event of a wildfire. These roads are the only fire engine and truck accessible roads for this area of the district and have been used historically for both detection and response numerous times. Changing the status of FSR 30151 to an ATV trail has little to no effect for fire and fuels in that it offers very little access for trucks and is largely impassable to anything but ATVs.

Alternative 3

Only the differences were analyzed between Alternative 2 and Alternative 3 proposed actions. Only the effects of the differences will be summarized here.

Action 2: (Ponderosa and Mixed Conifer Group Selection). The reduction in acreage will serve to minimize the effects of the treatments proposed as compared to the Modified Proposed Action. Removal of the prescribed fire component of this action item will reduce the efficacy of the proposed action to make stands more resilient to disturbance, namely wildfire, in that canopy base height would be lower and ladder fuels would be more abundant post-treatment in the Alternative 3 action as compared to the Modified Proposed Action.

Action 3: (Artificial Reforestation with Site Preparation). Without removing or significantly reducing the amount of manzanita at the site, the danger of negative effects from wildfire remains high. On 97th percentile days the predicted mortality of the trees on the site would be 80 percent. In addition, without the site preparation proposed in the Modified Proposed Action, planted seedling mortality would reasonably be 80 percent or higher if a wildfire occurred.

Action 4: (Ponderosa Pine Stand Improvement). The reduction in acreage will serve to minimize the effects of the treatments proposed as compared to the Modified Proposed Action. A smaller area treated results in a greater amount of ladder fuels and tighter crown spacing in the remaining stand. This will increase the potential for crown fire and large scale fire growth with negative impacts such as high tree mortality.

Action 5: (Wildland Urban Interface Treatment). Areas of no treatment in the unroaded/undeveloped areas may serve as corridors for wildfire to cross the proposed fuel breaks and therefore would negate the usefulness of the fuel breaks.

Action 6: (Use of Roads and Update to the Transportation Plan). Closing FSR 30151 would slow detection and response time to wildfires in the area, allowing fires to grow larger and less manageable before actions are taken. This in effect increases the amount of time spent controlling or managing a wildfire and may increase firefighter and public exposure to unsafe conditions and smoke.

Summary of Effects

Table 26. Summary of effects for fire and fuels by alternative.

Effect (Direct, Indirect, And Cumulative)	Alternative 1 (No Action) Effect	Alternative 2 (Modified Proposed Action) Effect	Alternative 3 Effect
Fire Effects on Forest Resources	No measureable direct and cumulative effects. Indirectly could increase potential of negative fire effects by increasing the risk of high severity fire.	Generally the proposed actions make the treatment area more resilient and less likely to be negatively impacted by large scale fire. Lop and scatter proposed in Action 4 could result in negative fire effects.	Indirectly could lead toward negative effects from large fires through increased response times and reduction in treatments as compared to Alternative 2.
Safety of Firefighting Personnel and Public	No measureable direct and cumulative effects. Indirectly will increase large fire and crown fire potential therefore increasing firefighter and public exposure to fire and associated risks.	By lowering the risk of high severity fire this alternative will reduce negative fire effects which pose a danger to firefighters and the public. Lop and scatter may increase risk and exposure.	By lowering the risk of high severity fire, could improve firefighter and public safety but not as much as Alternative 2.
Smoke and air quality	By increasing the risk of high severity fire, air quality could be negatively affected because of increased smoke output from large scale fires.	Air quality would be impacted by some of the proposed treatments during implementation but not as negatively or as largely as Alternative 1. Treatments would reduce potential for smoke output from large wildfires.	Less smoke impacts than Alternative 2 during implementation due to reduction or elimination of some proposed prescribed fire actions. Potential for increased smoke output and negative impacts to air quality from wildfires due to road closures and reduction in treatments.

SOIL RESOURCE

Introduction

This section presents a summary of the Soils Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Soils Specialist Report contained in the project record. Included in this section are summaries of the affected environment and environmental consequences of each of the three alternative actions described in Chapter 2.

Affected Environment

The Mitchell Spring Vegetation Improvement Project (MSVIP) area is located within “Main Canyon” area of the Escalante Ranger District. The soil resource variables that are potentially affected by this type of a project and have been analyzed for effects are detrimental soil

disturbance, ground cover, above-ground organic matter, and the amount of road surface contributing to erosional losses. The potential effects to these variables and thresholds for determining effects are found in Table 27 (additional rationale and references for these indicators and measures are found in the Soils Specialist Report).

Table 27. Soil indicators and measures that were used for analysis

Soil Indicator	Measure	Measure Threshold
Detrimental Soil Disturbance	Detrimental Soil Displacement Detrimental Soil Compaction Detrimental Soil Puddling Severely Burned Soil	Less than 15 percent of detrimental soil disturbance for an activity area. (Activity areas are 1,505 acres for Modified Proposed Action-Alternative 2 and 741 acres for Alternative 3)
Ground Cover	Effective Ground Cover	Maintain 80 percent effective ground cover.
Above-ground Organic Matter	Litter Coarse Woody Debris	Maintain litter level of 2 to 2.5 centimeters. Maintain at least 5 to 10 tons/acre for ponderosa pine and 7 to 12 tons/acre for mixed conifer.
Road Surface Contributing to Erosional Losses	Water Erosion Prediction Program – Road Interface (WEPP-Road)	Amount of sediment production from roads within the (4,313 acre) project area.

Environmental Consequences

A summary of the direct, indirect, and cumulative environmental consequences are disclosed together for each alternative.

Alternative 1 (No Action)

In summary, any measureable effects of the No Action Alternative on soils would be primarily from previous actions and natural processes within the project area. The condition, processes, and trends described in the existing condition section would continue.

Alternative 2 (Modified Proposed Action)

The Modified Proposed Action would increase detrimental soil disturbance by about 5 percent within the activity areas from the existing condition analysis. Detrimental soil compaction from timber harvest and prescribed fire activities are the primary sources of increases to detrimental soil disturbance. Ground cover and above-ground organic matter could also be adversely affected by the Modified Proposed Action. Prescribed fire activities will need to be implemented with best management practices that minimize the effect on soil surface conditions. The transportation system can effectively be managed with best management practices that will minimize effects of sediment leaving the road surface and into critical riparian areas.

Alternative 3

Alternative 3 would increase detrimental soil disturbance by about 7.5 percent within the activity areas from the existing condition analysis. Detrimental soil compaction from timber harvest and prescribed fire activities are the primary sources of increases to detrimental soil disturbance. Ground cover and above-ground organic matter could also be adversely affected by the proposed action of Alternative 3. Prescribed fire activities will need to be implemented with best management practices that minimize the effect to soil surface conditions. The transportation system can effectively be managed with best management practices that will minimize effects of sediment leaving the road surface and into critical riparian areas.

Summary of Effects

Table 28. Summary of effects for the soil resource by alternative.

Effect (Direct, Indirect, And Cumulative)	Alternative 1 Effect (No Action)	Alternative 2 Effect (Modified Proposed Action)	Alternative 3 Effect
Detrimental Soil Disturbance	2.6 to 3.5%	7.2%	10.1%
Ground Cover	>80% (Sufficient)	>80% (Sufficient)	>80% (Sufficient)
Above-ground Organic Matter	2.5 centimeters litter (Sufficient) 2.3 to 8.7 tons/acres of coarse woody debris (Deficient)	Litter levels and coarse woody debris will be maintained to increase slightly from timber sale activities.	Litter levels and coarse woody debris will be maintained to increase slightly from timber sale activities.
Road Surface Contributing to Erosional Losses	Forest System Roads 30150, 30151, 33939, 33942 and FH 17 have the highest potential for sediment movement and high runoff.	Existing roads and new temporary roads will be managed with best management practices to limit sediment movement.	Existing roads and new temporary roads will be managed with best management practices to limit sediment movement.

The Modified Proposed Action and Alternative 3 will meet the guidelines of the Dixie National Forest Land Resource Management Plan for the soil resource. The implementation of Soil and Water Conservation Practices included with the project would ensure that increases in sediment will be managed and long term soil productivity will be maintained.

HYDROLOGY

Introduction

This section presents a summary of the Hydrology Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Hydrology Specialist Report contained in the project record. Included in this section are summaries of the

affected environment and environmental consequences of each of the three alternative actions described in Chapter 2.

Affected Environment

The Mitchell Spring Vegetation Improvement Project (MSVIP) area is located within the Birch Creek and Upper North Creek 6th field subwatersheds; additionally, 7th level watersheds (they are smaller in size than a 6th field subwatershed) or 7th field equivalent drainages (7FED) were delineated so as to better capture the variability within the subwatersheds for analysis and were used for direct, indirect, and cumulative effects analyses. The hydrologic variables that are potentially affected by this type of a project and that have been analyzed for effects are: Streamflow (primarily peak flows), Water Quality (which includes temperature and sedimentation on both streams and springs), and Channel Morphology (change to stream channel shape and substrate). The potential effects to these variables and thresholds for determining effects are found in Table 29 (additional rationale and references for these factors and thresholds are found in the Hydrology Specialist Report).

Table 29. Hydrologic variables, factors, and thresholds likely for a vegetation improvement project that were used for analysis.

Hydrologic Variable	Factor	Threshold
Streamflow	Canopy Removal	15 percent of a 7FED's canopy being removed
Streamflow	Roaded Area (includes both active and inactive roads)	12 percent of a 7FED being roaded
Water Quality (Water Temperature)	Shade Removal	If removing riparian vegetation is part of the treatment.
Water Quality (Turbidity from Sedimentation)	Ground Disturbance in Riparian Area and Road Stream Connectivity	If ground disturbing equipment is allowed in the riparian areas more than an occasional necessary crossing. If there are multiple roads with direct connections to streams (i.e., the ditchline flows to a stream) and professional judgment as to whether the amount of sediment contribution from these connections is more than natural background inputs elsewhere along the stream.
Channel Morphology	Ground Disturbance along the Streambank and Road Stream Connectivity	If ground disturbing equipment is allowed in the riparian areas more than an occasional necessary crossing. If there are multiple roads with direct connections to streams (i.e., the ditchline flows to a stream) and professional judgment as to whether the amount of sediment contribution from these connections is more than natural background inputs elsewhere along the stream.
Channel Morphology	Peak Flows	If peak flows are measurably increased as per the threshold defined with the streamflow variable.

Environmental Consequences

A summary of the direct, indirect, and cumulative environmental consequences are disclosed together for each alternative. Cumulative effects included prior vegetation management projects, wildfire, current grazing and off-road ATV impacts, and future vegetation management projects.

Table 30. Canopy and road change as a result of the action alternatives

7FED	Past (since 1985) and Future (excluding the action alternatives) Percent 7FED Disturbance in the Form of Canopy Removal	Alt 2 Percent 7Fed Canopy Removal (Gustafson 2015)	Alt 3 Percent 7Fed Canopy Removal (Gustafson 2015) ⁶	Alt 2 Percent 7Fed Roaded	Alt 3 Percent 7Fed Roaded
Corn Creek-Cherry Creek	24.1	0.1	0	0.8	0.8
Jake Hollow	4.1	0	0	0.6	0.5 to 0.6
Spencer-Water Canyon	7.5	0.7	0.3	0.5	0.5
Upper Birch Creek-Hall Creek	1.1	2.6	1.2	0.7	0.6

Alternative 1 (No Action)

In summary, any measureable effects of the No Action Alternative on hydrology would be primarily indirect and would be related to the No Action Alternative leading to a large scale, high severity fire and the effects associated with such an event. Hydrologic processes in the project area would likely be impacted for many years if such an event occurs, leading to exceedances in forest, regional, and state standards for water quality.

Alternative 2 (Modified Proposed Action)

Although it could lead to a small increase in sediment delivered to Hall Creek from a short term increase in road use, with the proper use of BMPs the Modified Proposed Action is unlikely to directly, indirectly, or cumulatively have any measureable effects to hydrology that are contrary to the Forest Plan and desired conditions (see Hydrology Report for a discussion on why the minor amount of treatment in the Corn Creek Cherry Creek 7FED, which is already over the 15 percent canopy removal threshold, is not likely to lead to a measureable cumulative effect beyond what currently exists). While not likely measureable, there could be a slight and discrete short term increase in turbidity from the increase in sediment delivery to Hall Creek. However, the Modified Proposed Action is likely to reduce the risk of a high severity large scale fire and the associated undesirable impacts to hydrology of the drainages.

⁶ Percent canopy change was calculated for the stands immediately after treatment and therefore is the maximum amount of canopy removal that could be expected.

Alternative 3

With the proper use of BMPs, action Alternative 3 is unlikely to directly, indirectly, or cumulatively have any measureable effects to hydrology that are contrary to forest plan and desired conditions. Although not likely measurable, compared to Alternative 2, Alternative 3 could have less direct impacts to hydrology by having fewer acres of treatment but more indirect impacts in the sense of increasing, by a small amount, the risk of a high severity fire. Alternative 3 would also have less long term sediment contribution and turbidity to the streams than Alternatives 1 and 2 due to the removal of FSR 30151 (although it is a very small but measureable amount of sediment decrease, the hydrologic impacts of a turbidity decrease and substrate distribution change are unlikely to be measureable).

Summary of Effects

Table 31. Summary of effects.

Effect (Direct, Indirect, And Cumulative)	Alternative 1 Effect	Alternative 2 Effect	Alternative 3 Effect
Streamflow	No measureable direct and cumulative effects. Indirectly could increase peak flows by increasing the risk of high severity fire and the hydrologic impacts associated with fire.	No likely measureable direct or cumulative effect. Indirectly could lead toward desired conditions by lowering the risk of high severity fire.	No likely measureable direct or cumulative effect. Indirectly could lead toward desired conditions by lowering the risk of high severity fire but would not lower it as much as Alt. 2.
Water Quality	No measureable direct and cumulative effects. Indirectly could increase water temperature and turbidity by increasing the risk of high severity fire and the hydrologic impacts associated with fire.	No likely measureable direct or cumulative effect (could have some small non-measureable undesirable effects to water quality by increasing a small amount of sediment to the streams – see full report for more discussion). Indirectly could lead toward desired conditions by lowering the risk of high severity fire.	No likely measureable direct or cumulative effect; however, could have less non-measureable undesirable effects to water quality than Alt. 2. Indirectly could lead toward desired conditions by lowering the risk of high severity fire but would not lower it as much as Alt. 2.
Channel Morphology	No measureable direct and cumulative effects. Indirectly could lead to alteration of channel dimensions by increasing the risk of high severity fire and the hydrologic impacts associated with fire.	No likely measureable direct or cumulative effect. Indirectly could lead toward desired conditions by lowering the risk of high severity fire.	No likely measureable direct or cumulative effect. Indirectly could lead toward desired conditions by lowering the risk of high severity fire although not as much as Alt. 2.

RECREATION RESOURCE

This section is a summary of the Recreation Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Recreation, Scenery, Inventoried Roadless Area, and Developed Character Specialist Report contained in the project record. Included in this section are summaries of the affected environment and environmental consequences of each of the three alternative actions described in Chapter 2.

Affected Environment

There are a variety of dispersed recreation opportunities in the project area. Historically, the major recreation use has been hunting, hiking, off highway vehicle (OHV) use, sightseeing or driving for pleasure and mountain biking. Winter recreation may include cross-country skiing, snowmobiling, and snowshoeing.

Environmental Consequences

Alternative 1 – (No Action)

Direct Effects

There are no direct effects of choosing the no action alternative.

Indirect Effects

The conditions described in the Affected Environment would prevail over most of the area. The recreation activities described in the Affected Environment, with the exceptions of fuelwood gathering and Christmas tree cutting, are expected to increase in response to the publicity the area is receiving and overall recreation use trends. If lack of vegetation treatments resulted in a high intensity fire, recreational activities where viewing scenery is an integral part of the recreational experience (i.e., hiking, sightseeing, or driving for pleasure, and, to a lesser extent, OHV riding and mountain biking) would likely be affected. The impact on the recreational experience would reduce the number of individuals engaged in these activities within the project area causing them to move elsewhere on the forest or leave the area entirely.

Cumulative Effects

The cumulative effects area (CEA) along with past, present, and future management activities within the CEA are identified above. The combination of these activities would have only limited and isolated effects on the recreation resource in the project area. However; should the No Action Alternative result in a crown fire and spread through the CEA, the amount of recreation activity in the CEA would be expected to decrease.

Alternative 2 – (Modified Proposed Action)**Direct Effects****Dispersed Camping**

Due to the limited amount of dispersed camping that occurs within the project area, the overall effect on dispersed camping would be minimal. The most noticeable impact would occur where dispersed campsites are located on FSR 30150, which is also a haul road. During management activities, dispersed camping participants might move to other sites, but would likely return to the area once the management activities are completed.

Hunting

Due to the small size of the project area, the proposed action would have little to no effect on hunting.

Hiking

Hikers would be the most affected by the Modified Proposed Action. Since hikers travel at a slower speed, the visual effects of the proposed treatments would be more evident. During timber removal log trucks and other logging-related traffic would use FSR 30151. A portion of the Hall Creek Trail follows this road. Dust and traffic could adversely affect non-motorized users. The likelihood of hikers meeting logging trucks is low due the overall low use in the area.

Horseback Riding

The effects of implementing the Modified Proposed Action would be similar to those described for hiking.

Pleasure Driving

Approximately 5.36 miles of FSR 30150 which was closed under MTP would be opened to motorized vehicles. This is a high clearance road suitable for trucks and sport utility vehicles. FSR 30151 would be closed to full size vehicles. This road is also a high clearance road but is more suitable for OHVs, jeeps, and high clearance 4-wheel drive vehicles. FSR 30538 (0.79 miles) would also be reclassified as open. In all, 2.03 additional miles of road would be reclassified as opened to motorized vehicles and an additional 4.27 miles would be closed to full size vehicles. Log landings located along FH 17 would have some effect on pleasure driving. Delays would be brief in frequency and duration.

Off Highway Vehicle Riding

The effects of the Modified Proposed Action on OHV riding would be similar to the effects of pleasure driving with the exception of FSR 30151 which would be reclassified as a motorized trail. This alternative would increase the miles of roads and trails open to OHVs by 6.30 miles.

Recreation Special Uses

Special uses are directly tied to different recreation activities. For example, the outfitter and guide who take clients hunting would be affected by the degree to which the Modified Proposed Action would affect hunting. As described above, the effects of implementing the proposed action on these activities would be within acceptable limits.

Other Recreational Activities

The Modified Proposed Action would have minimal, if any, effect on personal use Christmas tree cutting. There would be a short-term increase in the amount of fuelwood gathering following harvest activities. Firewood cutters would target wood left on the ground and in landing slash piles.

Indirect Effects

The conditions described in the Affected Environment would prevail over most of the area. The recreation activities described in the Affected Environment, with the exceptions of fuelwood gathering and Christmas tree cutting, are expected to increase in response to the publicity the area is receiving and overall recreation use trends. If lack of vegetation treatments resulted in a high intensity fire, recreational activities where viewing scenery is an integral part of the recreational experience (i.e., hiking, sightseeing or driving for pleasure, and, to a lesser extent, OHV riding and mountain biking) would likely be affected. The impact on the recreational experience would reduce the number of individuals engaged in these activities within the project area causing them to move elsewhere on the forest or leave the area entirely.

Cumulative Effects

Disruptions in recreation use within the analysis area due to the proposed management actions would cause some recreation participants to move elsewhere in the cumulative effects area or possibly outside the area. Such disruptions in recreation use would be short lived. The proposed action is not expected to affect recreation use trends. Long-term use is expected to increase at previously projected levels.

Alternative 3**Direct Effects****Dispersed Camping**

Due to the limited amount of dispersed camping that occurs within the project area, the overall effect on dispersed camping would be minimal. The most noticeable impact would occur where dispersed campsites are located on FSR 30150 which is also a haul road. During management activities, dispersed camping participants might move to other sites, but would likely return to the area once the management activities are completed.

Hunting

Due to the small size of the project area, Alternative 3 would have little to no effect on hunting.

Hiking

Hikers would be the most affected by the Alternative 3. Since hikers travel at a slower speed, the visual effects of the proposed treatments would be more evident. During timber removal log trucks and other logging related traffic would use FSR 30151. A portion of the Hall Creek Trail follows this road. Dust and traffic could adversely affect non-motorized users. The likelihood of hikers meeting logging trucks is low due the overall low use in the area.

Closing roads would not affect hikers as road closures or timing restrictions would only apply to motorized use.

Horseback Riding

The effects of implementing Alternative 3 would be similar to those described for hiking.

Pleasure Driving

Forest Service Road 30151 would be closed. This road is a high clearance road approximately 4.27 miles long and suitable for OHVs, jeeps, and high clearance 4-wheel drive vehicles. FSR 30150 (5.36 miles) and 30538 (0.79 miles) would remain closed. This alternative would close all motorized routes within the project area except FH 17, resulting in 4.27 fewer miles of open road than the No Action alternative and 6.30 fewer miles of open road than Alternative 2.

Log landings located along FH 17 would have some effect on pleasure driving. Delays would be brief in frequency and duration.

Off Highway Vehicle Riding

The effects of Alternative 3 on OHV riding would be the same as on pleasure driving.

Recreation Special Uses

Special uses are directly tied to different recreation activities. For example, the outfitter and guide who take clients hunting would be affected by the degree to which Alternative 3 would affect hunting. As described above, the effects of implementing the proposed action on these activities would be within acceptable limits.

Other Recreational Activities

Alternative 3 would have minimal, if any, effect on personal use Christmas tree cutting. There would be a short-term increase in the amount of fuelwood gathering following harvest activities. Firewood cutters would target wood left on the ground and in landing slash piles. Because Alternative 3 would treat fewer acres than the Modified Proposed Action, the increase in available firewood would not be as great as the Modified Proposed Action. There is no shortage of available firewood on the Escalante Ranger District.

Indirect Effects

During project implementation, most recreationists would likely avoid the area. Sightseeing could increase as interested public drive through the area to view logging areas.

Evidence of jeeps and OHVs is occasionally seen in the non-motorized areas north of the project area including the Griffin Point Trail. This illegal activity is likely to increase when temporary roads FSR 31446 and FSR 31447 are opened, improving access to the non-motorized area.

Cumulative Effects

Disruptions in recreation use within the analysis area due to management actions proposed in Alternative 3 would be similar to the Modified Proposed Action. Some recreation participants would move elsewhere in the cumulative effects area or possibly outside the area. Such

disruptions in recreation use would be short lived. The Alternative 3 is not expected to affect recreation use trends. Long-term use is expected to increase at previously projected levels.

SCENERY RESOURCE

This section is a summary of the Scenery Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Recreation, Scenery, Inventoried Roadless Area, and Developed Character Specialist Report contained in the project record. Included in this section are summaries of the affected environment and environmental consequences of each of the three alternative actions described in Chapter 2.

Affected Environment

The characteristic landscape can be described as rolling high mountain forest and meadows which cover plant communities ranging from mixed conifer, ponderosa pine, pinyon pine/juniper, sagebrush, riparian, and small amounts of scattered aspen.

There are three variety classes that identify the scenic quality of a natural landscape:

- Class A – Distinctive
- Class B – Common
- Class C – Minimal

Most of the analysis area has been classified as common. Occasionally the area becomes distinctive. This occurs when terrain and vegetation allow views of the cliffs below the Barney Top plateau or vast views of the desert to the south.

Form is found in the tree lines and ridgelines. Line is expressed in the short vertical reaches of the trees and the horizontal reaches of the road cuts. Color is a blend of the dark green of conifers and lighter green of the sagebrush and meadows. In the winter, conifers contrast sharply with the white snowfields. Texture varies from the roughness of the conifers and sage to the softness of the grassy meadows.

Table 32. Management area and assigned Scenic Integrity Objectives (SIO) within the Mitchell Spring project area.

Management Area Description	Management Area Code	SIO
General Direction	1	Moderate
Roaded Natural Recreation	2B	Moderate
Livestock Grazing	6A	Moderate
Wood Production and Utilization	7A	Low
Riparian Management	9A	Moderate
FH 17 Travel Corridor	Concern Level 2	Moderate

The cumulative effects area for the scenery resource is defined by two areas: the project area and the FH 17 view corridor. The CEA for the project area is the area itself. This area was selected because vegetation and topography will prevent viewing management activities from outside the area, and no management activities were identified outside the area that would be visible from

within the project area. The CEA for FH 17 is the view corridor of the road, from its intersection with SR-12 to the Escalante Summit. This area was chosen because persons driving thru the project area are likely to be driving the entire length of this road.

Within the CEA, past management activities that may affect the scenery resource have included timber harvesting, pre-commercial thinning, tree planting, prescribed fire, and livestock grazing. The Corn Creek wildfire burned over 2,000 acres in the CEA in 2008. Development on private land along FH 17 has also affected the scenery in this view corridor.

Current management activities include livestock grazing, firewood, post cutting, and trail maintenance.

Environmental Consequences

Alternative 1 – (No Action)

Direct Effects

There are no direct effects of choosing the No Action Alternative.

Indirect Effects

The conditions described in the Affected Environment would prevail over most of the area. If failure to treat the WUI or other vegetation treatments resulted in a catastrophic fire, both long term and short term changes in the scenery would occur. Immediately the fire the area would be dominated by black and brown colors, vertical lines of the trees would dominate the views, and the form of the landscape and distant vistas would be more obvious. Within 5-7 years, new vegetation would significantly revegetate the ground.

Cumulative Effects

The cumulative effects area along with past, present, and future management activities within the CEA area are identified above. The combination of these activities would have only limited and isolated effects on the scenery resource in the CEA. However, should choosing the No Action Alternative result in a crown fire and spread through the CEA, the impacts on scenery could be considerable. Outside of such an event, the No Action Alternative (Alternative 1) would have no effect on the scenery within this view corridor and therefore would have no cumulative effect.

Alternative 2 – (Modified Proposed Action)

Direct Effects

Landscape Character

The Modified Proposed Action would cause both short-term and long-term changes in landscape character in the analysis area. However, because the amount of vegetation removed is light, the change would be minor. The stands' character would change to a slightly more open condition. Removing some of the overstory would display slightly greater visual variety. The visual

condition would have a greater chance of being sustained, as the likelihood of a major fire or insect disturbance would be reduced.

Form

This visual element is usually dominant because of the vast scale involved. Examples in the project area include meadows, tree lines, and ridgelines. The Modified Proposed Action would have no effect on form in the project area.

Line

Trees provide important vertical line values to the forest landscape. In other instances horizontal lines, such as those made by a roadbed, road cuts, and fills, present an unnatural contrast with the surrounding vegetation. Roads and skid trails would become more visually evident as vegetation and debris that have established are worn away. The result would be to increase the unnatural appearance of the roadbed. Any existing road cuts currently visible would remain visible. After one or two growing seasons, the skid trail system would become more natural in appearance as vegetation begins to grow and debris accumulates on the site. However, skid trails may not be fully integrated into the landscape until tree regeneration has occurred for a 5-10 year period. Vertical lines of some trees would become more evident because of the increased openness of the stand. This would be particularly evident in the mixed conifer stands adjacent to FH 17.

This alternative would use roughly 2.9 miles of temporary roads to remove timber. After harvest, these roads would be decommissioned. Decommissioning would be accomplished using barricades, waterbars, coarse woody debris, or ripping. As a result, these roads would be more evident in the short-term. The decommissioned roads would return to a more natural appearance over time; however, if waterbars or barricades are used, the unnatural appearance would remain for an indefinite period of time.

Color

The color element in the landscape would be increased with the Modified Proposed Action. In the short term, disturbances created by skidding and burning result in more earth browns and burnt blacks showing. After one growing season, naturally regenerated grasses and forbs would restore the yellow/green colors that would contrast with the darker greens of the conifers. Whole tree harvesting would prevent slash from accumulating along FH 17 and trail foreground zones. The creation of large bare brown soil areas from landings and skid trails would detract from the area's color scheme in the short-term. In the long term the aspen component of the forest would increase in group selection treatments adding more color variety from the light boles of the trees and light green or yellow leaves.

For trail users, there would be a short-term visual impact from the resulting ground disturbance since the Hall Creek Trail passes through proposed harvest areas. Trail users typically travel at a slow pace and would therefore see the changes for longer time periods. This may be visually unacceptable to some users until the skid trails were covered again with new growth. Project design features identified above would be used to keep impacts within the parameters needed to meet the appropriate SIOs.

Texture

Under the Modified Proposed Action, the overall vegetative texture would become softer as the rough sage, pinyon, and junipers are replaced by the softer looking grasses and forbs. Within 3-4

years after treatment, sage would reestablish itself and the texture would become rougher. The proposed treatments would create slightly more irregularity in the canopy as tree age and size class become more diverse. Textural variety in both the short- and long-term would be maintained.

Concern Level and Scenic Integrity Objectives (SIOs)

The Modified Proposed Action would not lower SIOs within the project area. The SIOs identified above would be met.

Cumulative Effects

With this alternative, the analysis area would remain visually attractive to the public. No reasonably foreseeable actions were identified which would likely be seen from within this analysis area.

The Corn Creek Fire, development on private land, and the proposed action will all affect the scenery within this view corridor. Public reaction to these changes varies by individual; however, the scenery is expected to remain visually attractive to the public. The resulting SIO is expected to be moderate or higher.

Alternative 3

Direct Effects

The effects to scenery from Alternative 3 would be the same as Alternative 2 with the exception of texture. Eliminating units 9, 10, 11 and 12 would leave texture as is in these units. The changes to landscape character, line, form, and color would be the same as Alternative 2.

Cumulative Effects

With this alternative, the analysis area would remain visually attractive to the public. No reasonably foreseeable actions were identified which would likely be seen from within this analysis area.

The cumulative effects of Alternative 3 on the FH 17 view corridor would be the same as Alternative 2.

Summary of Effects

No irreversible or irretrievable effects would occur to scenic quality as a result of the No Action, Modified Proposed Action, or Alternative 3. Because vegetation grows back over time, timber harvesting and other proposed treatments would not cause any irreversible impacts.

ROADLESS RESOURCE

This section is a summary of the Roadless Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Recreation, Scenery, Inventoried Roadless Area and Developed Character Specialist Report contained in the project record.

Included in this section are summaries of the affected environment and environmental consequences of each of the three alternative actions described in Chapter 2.

Affected Environment

Inventoried Roadless Areas

Inventoried Roadless Areas (IRAs) are those areas identified in a set of Inventoried Roadless Area maps contained in the Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, and any subsequent update or revision of those maps through the land management planning process (USDA 2000b)(36 CFR 294.11).

The Mitchell Spring project area is adjacent to the Jake Hollow Inventoried Roadless Area. A portion of FSR 30150 and all of FSR 30538 “cherry stems” into the IRA. This cherry stemmed road corridor is 200 ft. wide and is not part of the IRA. These routes were open and classified during Motorized Travel Planning but the portion that enters the IRA was designated as closed with that decision.

Environmental Consequences

Alternative 1 – (No Action)

Direct, Indirect, and Cumulative Effects

This alternative would have no effect on the Jake Hollow IRA. The portion of FSR 30150 and FSR 30538 that enters the IRA would be closed to motorized travel but would remain a visible sign of development.

Alternative 2 – (Modified Proposed Action)

Direct, Indirect, and Cumulative Effects

Alternative 2 would designate the portion of FSR 30150 and FSR 30538 which cherry stem into the IRA as open. Open roads which cherry stem into the IRA do not disqualify the area from IRA designation. This alternative would not change the character or size of the IRA itself.

Alternative 3

Direct, Indirect, and Cumulative Effects

With this alternative, the designation of FSR 30150 and FSR 30538 would remain closed as decided under MTP. In addition, FSR 30151 which borders the IRA would also be closed. This alternative would have no effect on the Jake Hollow IRA.

Undeveloped Areas

Field Surveys for Undeveloped Character

The project area was evaluated for areas that meet the criteria for unroaded or undeveloped character as outlined in the *Intermountain Region Planning Desk Guide Draft, Roadless Area Inventory and Evaluation Protocol, October 28, 2004* (USDA 2004a).

As described in the Guide, there are 3 types of criteria that are used to evaluate an area's roadless or undeveloped character: size, presence of roads, and presence of facilities or influences of man. These criteria are described as follows:

Size: They contain 5,000 acres or more, or they contain less than 5,000 acres but:

- a. Due to physiography or vegetation, they are manageable in their natural condition.
- b. They are self contain ecosystems such as an island.
- c. They are contiguous to existing wilderness, primitive areas, administration-endorsed wilderness, or roadless areas in other Federal ownership, regardless of their size.

Roads: Roadless areas do not contain classified roads. A classified road is identified as follows.

1. All roads determined through roads analysis to be part of the Forest Transportation System.
2. All roads placed in the roads database, given road management objectives, given a forest road number, signed, and ascribed a maintenance level.

Presence of other facilities or influences of man:

The presence of facilities, structures and features may disqualify an area from roadless inventory unless they are substantially unnoticeable. Features to consider include: airstrips and heliports, plantations, terracing, electronic installations, electric transmissions lines, evidence of historic mining, structural and nonstructural range improvements, recreation improvements, man-made lakes or reservoirs greater than 5 acres, heavily used dispersed recreation areas along travel routes, timber harvest areas where logging and prior road construction are evident, and any mechanical treatment greater than 5 acres in size.

Undeveloped Area Evaluation Results

Results of field surveys within the project area found evidence of timber harvest (stumps, roads and skid trails) throughout the area. Based on the "Presence of other facilities or influences of man" criterion above, none of the project area can be described as unroaded/undeveloped. Because the project does not contained areas that qualify as unroaded/undeveloped, this resource will not be discussed further in this document (see the Developed Character Specialist Report within the Recreation, Scenery, Inventoried Roadless Area and Developed Character Specialist Report contained in the project record.

RANGE RESOURCE

This section is a summary of the Range Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Range Specialist Report contained in the project record. Included in this section are summaries of the affected environment and environmental consequences of each of the three alternative actions described in Chapter 2 on livestock management and noxious weeds.

Affected Environment

The project area encompasses a portion of the North Creek grazing allotment. All of the proposed treatments are located in the Main Canyon unit of the allotment. A very small portion of the project area falls into the North Creek unit of the allotment, but there are no proposed treatments within the unit.

Livestock Management

Several structural range improvements (fence, water development, and a distribution line) can be found throughout the project area. There is approximately 0.5 mile of fence that crosses through the northeastern corner of the project area. There is a water development along Birch Creek that collects water and supplies 2.5 miles of livestock water distribution pipeline located in the project area. This pipeline continues past the project boundary and fills several water troughs.

All of the project area is suitable for livestock grazing. Suitability is determined through the Dixie National Forest Land and Resource Management Plan (Forest Plan) which determines whether livestock grazing is a suitable activity within a given management area. All of the management areas included in the project area consider livestock grazing to be a suitable activity.

Rangeland capability represents the classification of those areas that possess the bio-physical characteristics that indicate the rangeland has the ability to produce sufficient forage to sustain livestock grazing. Capable acres within the project area were determined as those that were within a mile of water, on slopes less than 30% and were expected to produce more than 200 lbs./acre of grazing forage. Of the 4,313 acres in the project area there are currently 106 acres that are capable. The primary limiting factor within the project area is the vegetation type since the ponderosa pine (*Pinus ponderosa*) and pinyon-juniper (*Pinyon* spp.-*Juniperus* spp.) communities were not considered capable of producing >200 lbs./acre of grazing forage. In addition the eastern third of the project area is also more than a mile from water which also made it non-capable.

Noxious Weeds

The authority for noxious weed management on the Escalante Ranger District is provided through the Dixie National Forest Environmental Assessment for Noxious Weed Management and Decision Notice (USDA 2000a). There is one site of musk thistle (*Carduus nutans*) along with bull thistle (*Cirsium vulgare*) found near the northeast corner of the project area. Both musk and bull thistles are classified as “Class B” weeds, weeds which have a moderate population throughout the State and generally are thought to be controllable in most areas (State of Utah

2008). Rubber rabbitbrush (*Ericameria nauseosa*) was recently added to the Garfield County Noxious Weed List (Garfield County 2013). There is rubber rabbitbrush in the project area, but total acres are not known since it has not yet been mapped. Several sites of noxious weeds, including musk thistle (*Carduus nutans*), bull thistle (*Cirsium vulgare*), White top (*Lepidium draba*), and Spotted knapweed (*Centaurea maculosa*) have been found within the project boundary in the past, but appear to have been eradicated.

Environmental Consequences

Alternative 1 – (No Action)

Direct and Indirect Effects

Livestock Management

Under the No Action alternative there would be no changes in capable acres, permitted livestock numbers, or season of use. Livestock management would continue in accordance with current plan direction. Thus, there would be no direct or indirect effects.

Noxious Weeds

Under the No Action alternative there would be no increased risk of new noxious weed infestations. Current vectors (i.e., recreation, livestock, and wildlife) would continue to utilize the area with the potential for new infestations to occur. Monitoring of existing noxious weed populations and survey for new infestations would continue to occur. Likewise, treatment of known and new weed populations would continue to occur. Thus, there would be no direct or indirect effects.

Cumulative Effects

Livestock Management

Since there would be no direct or indirect effects there would be no cumulative effects to livestock management under the No Action alternative.

Noxious Weeds

Since there would be no direct or indirect effects there would be no cumulative effects to noxious weeds under the No Action alternative.

Summary of Effects

Under this alternative there would be no direct, indirect, or cumulative effects to livestock management or noxious weeds.

Alternative 2 – (Modified Proposed Action)**Direct Effects*****Livestock Management***

Implementation of Alternative 2 will change vegetation and overstory structure. This is expected to increase understory forage availability. Of the proposed treatments, it is expected that group selection and tree control treatments will have the biggest effect on livestock management due to the reduction in basal area and prescribed burning activities. For this reason only those two treatment types were used in the capability assessment (see Range Specialist Report in the Project Record) for Alternative 2, which projects an expected increase of 494 capable acres, for a total of 600 acres in the project area. This increased amount of capable acres is not enough to warrant a change in the permitted livestock numbers or season of use within the North Creek Allotment.

Livestock management could be affected in the short term following prescribed burning activities due to the requirement that those areas will need to be rested (see PDF RG-2). It is expected that rest will be accomplished through grazing system rotations, herding, and salting to keep livestock out of the burned areas to minimize impacts on regeneration and seeding establishment of vegetation. Temporary fencing or rest of the entire pasture may be needed if grass reseeding height monitoring indicates that the aforementioned management techniques do not work. If full pasture rest were required this would affect permitted livestock numbers or season of use in the short term.

Noxious Weeds

Under Alternative 2 there would be no direct effects to noxious weeds. Existing populations would continue to be monitored and treated.

Indirect Effects***Livestock Management***

There would be no indirect effects to livestock management under Alternative 2.

Noxious Weeds

Noxious weeds may be indirectly affected from implementation of Alternative 2 due to increased disturbance in the area through mechanical and burning activities. Disturbed areas are more susceptible to infestation of noxious weeds. Likewise, increased use of mechanical equipment in the area can be a vector for weed seed to be brought into the area. Established project design features are expected to reduce the indirect effects on noxious weeds.

Cumulative Effects

Livestock Management

Under Alternative 2 there are no other activities within the cumulative effects area that would create additional effects than those described in the direct and indirect effects regarding livestock management. Thus, there would be no measurable cumulative effects to livestock management.

Noxious Weeds

Under Alternative 2 there are no other activities within the cumulative effects area that would create additional effects than those described in direct and indirect effects regarding noxious weeds. Thus, there would be no measurable cumulative effects on noxious weeds.

Alternative 3

Direct Effects

Livestock Management

Implementation of Alternative 3 will change vegetation and overstory structure. This is expected to increase understory forage availability. Of the proposed treatments, it is expected that group selection and tree control treatments will have the biggest effect on livestock management due to the reduction in basal area and prescribed burning activities; for this reason, only those two treatment types were used in the capability assessment for Alternative 3. Based on these treatment activities, capable acres are expected to increase by 115 acres to a total of 321 acres in the project area. This increased amount of capable acres is not enough to warrant a change in the permitted livestock numbers or season of use within the North Creek Allotment.

Livestock management could be affected in the short term following prescribed burning activities due to the requirement that those areas will need to be rested. It is expected that rest will be accomplished through grazing system rotations, herding, and salting to keep livestock out of the burned areas. Temporary fencing or rest of the entire pasture may be needed if monitoring indicates that the aforementioned management techniques do not work. If full pasture rest were required this would affect permitted livestock numbers or season of use in the short term.

Noxious Weeds

Under Alternative 3 there would be no direct effects to noxious weeds. Existing populations would continue to be monitored and treated.

Indirect Effects

Livestock Management

There would be no indirect effects to livestock management under Alternative 3.

Noxious Weeds

Noxious weeds may be indirectly affected from implementation of Alternative 3 due to increased disturbance in the area through mechanical and burning activities. Disturbed areas are more susceptible to infestation of noxious weeds. Likewise, increased use of mechanical equipment in the area can be a vector for weed seed to be brought into the area. Established project design features are expected to reduce the indirect effects on noxious weeds.

Cumulative Effects***Livestock Management***

Under Alternative 3 there are no other activities within the cumulative effects area that would create additional effects than those described in the direct and indirect effects regarding livestock management. Thus, there would be no measurable cumulative effects to livestock management.

Noxious Weeds

Under Alternative 3 there are no other activities within the cumulative effects area that would create additional effects than those described in direct and indirect effects regarding noxious weeds. Thus, there would be no measurable cumulative effects on noxious weeds.

Summary of Effects

The Modified Proposed Action and Alternative 3 will have minor direct effects to the rangeland resources. Noxious weeds and rangeland resources may experience indirect effects. There would be no measurable cumulative effects to any of the resources.

HERITAGE RESOURCE

The Mitchell Spring Project area was surveyed by forest archaeologists in 2012 and no Historic Properties were located within or adjacent to the proposed projects. State Historic Preservation Officer concurrence was received on July 27, 2015. There will be No Effect to any Historic Properties from any activities conducted for this project.

SOCIAL/ECONOMIC RESOURCE**Introduction**

This section provides a summary of the Social Economics Specialist Report. For more detailed discussion and analysis, and for a complete list of references consulted, see the Social Economics Report, contained in the project record. Included in this section are summaries of the affected environment and the environmental consequences for each of the three alternatives described in Chapter 2.

The financial aspects of the project will be measured in three ways: the potential volumes of forest products sold and cut; the financial feasibility of the proposed timber sale activities using a

cost benefit analysis; and the financial efficiency of the project as measured by present net value. The social and economic aspects of the project will be detailed by the impacts of the project alternatives on local economy, jobs, and labor income. Environmental justice or the project's impacts to minority and low income populations within the economic analysis area will also be discussed as required by Presidential Executive Order 12898.

Affected Environment

The economic analysis area for the Mitchell Spring Project is mostly rural with some metropolitan populations. The analysis area considered for economic effects is the six counties within the Dixie NF economic impact area. This area was chosen in order to examine a contiguous, functional economic area. The closest mill for processing of harvested wood products is located within Garfield County, UT. Other mills that regularly receive wood from the Dixie NF are within Sevier and Iron Counties. The closest full-service communities to the analysis area are Kanab and Cedar City, UT, within Kane and Iron Counties.



Figure 3. Dixie NF economic impact area.

Southern Utah has historically been a location for active use of the existing natural resources in subsistence and production. Agriculture and manufacturing have long played important roles in the rural counties. Local communities have benefited socially and economically from the abundant natural resources as population growth and development have occurred. Harvesting of Dixie National Forest timber has assisted in the development of communities by providing both raw materials for construction, as well as employment opportunities. Presently, timber production is declining as a use of Dixie NF lands as the quantity of timber offered and sold by the Forest has dropped since the early 1990s (USDA 2015b). Simultaneously, some local logging

companies and timber manufacturing facilities have slowed cutting and production, while others have closed operations (USDA 1998a).

The social environment has been formed in part by the traditional employment opportunities emphasizing use of the existing resources for production of commodities. The production of commodities in this area includes the ranching, farming, logging, and mining industries. Rural values are an integral part of the social environment, forming the lifestyles and livelihoods of the communities directly adjacent to the Dixie NF (USDA 1998a). In addition, a growing service industry based in tourist and recreation opportunities in the influence zone has developed due to the rural attributes, unique geography, and presence of several national parks and monuments.

Forest Products

Using a three year average from 2009 to 2011, the Dixie National Forest sold annually 20,591 CCF of forest products including saw timber, house logs, and fuelwood. Timber sale purchasers cut about 7,960 CCF of timber annually which is processed into wood products at regional sawmills.

Impacts to Jobs and Income by the Dixie National Forest

The Dixie NF has impacts to private sector economic activity (jobs and income) stemming from Forest Service expenditures for employee salaries and benefits and all other non-salary related expenditures such as ecosystem restoration, infrastructure construction and maintenance, business operations, etc. The Dixie NF provides or supports an estimated 1,092 jobs within the local economy. Employment estimates include all full-time, part-time, and intermittent jobs. Estimated labor income in 2012 from the economic impacts of current forest management and use was over \$37.6 million. Value added income or indirect and induced expenditures by forest users and businesses generated over \$57.6 million in economic activities. The total economic impacts that the Dixie NF and associated industries generate within the regional economy is estimated at \$95.4 million.

Management of the Dixie NF does have an impact on the economies of local counties. However, there are many additional factors that influence and affect the local economies, including changes to industry technologies, management of adjacent national forests and private lands, economic growth, and international trade.

Table 33. Current role of Forest Service-related contributions to the area economy.

	Employment (Jobs)	Labor Income (Thousands of 2012 dollars)	Value Added Income (Thousands of 2012 dollars)	Total Economic Output (Thousands of 2012 dollars)
Industry	FS-Related	FS-Related	FS-Related	FS-Related
Agriculture	296	\$1,363	\$4,435	\$13,246
Mining	0	\$24	\$46	\$115
Utilities	3	\$284	\$926	\$1,617
Construction	10	\$380	\$489	\$1,270
Manufacturing	6	\$309	\$506	\$3,291
Wholesale Trade	24	\$1,045	\$2,115	\$3,707
Transportation & Warehousing	25	\$1,314	\$1,725	\$3,385
Retail Trade	137	\$3,820	\$5,861	\$8,354
Information	7	\$271	\$493	\$1,309
Finance & Insurance	27	\$968	\$2,793	\$5,466
Real Estate & Rental & Leasing	44	\$507	\$6,005	\$8,004
Prof, Scientific, & Tech Services	29	\$899	\$1,572	\$2,582
Mngt of Companies	5	\$70	\$134	\$539
Admin, Waste Mngt & Rem Serv	24	\$637	\$837	\$1,477
Educational Services	8	\$132	\$166	\$309
Health Care & Social Assistance	52	\$2,335	\$2,561	\$4,396
Arts, Entertainment, and Rec	72	\$1,383	\$2,269	\$3,965
Accommodation & Food Services	241	\$4,601	\$6,663	\$12,770
Other Services	36	\$1,487	\$1,406	\$2,302
Government	45	\$15,774	\$16,646	\$17,369
Total	1,092	37,603	57,648	95,472
FS as Percent of Total	1.00%	1.07%	0.85%	0.76%

Environmental Consequences

Cumulative Effects Area

The spatial boundaries for analyzing the cumulative effects for social economics is the six counties within the Dixie NF's economic impact area as defined within Table 32 and Figure 2 on page 4 of the Social Economics Report. This is an appropriate effects area as Dixie NF timber production and resource management financial expenditures have the most impact within this area. The temporal boundary for analyzing the cumulative effects for social economics is the expected ten year timeline of the project. For the social economic discussion, all effects may be considered short term as an effect is only created when funds or dollars are expended on project activities or a forest product is processed into a useable product.

Alternative 1 (No Action)**Direct and Indirect Effects****Forest Products**

With no action, there will be no forest products removed from the project area. There are no direct or indirect effects.

Financial Feasibility and Efficiency

No costs or revenues are generated by Alternative 1; therefore there are no direct or indirect effects.

Jobs and Income

With no action, activities to benefit local economies will not occur.

Cumulative Effects

Since there are no direct or indirect effects with Alternative 1, there are no cumulative effects.

Alternative 2 (Modified Proposed Action)**Direct and Indirect Effects****Table 34. Resource indicators and measures for Alternative 2.**

Resource Element	Indicator	Measure	Alternative 2
Forest Products	Use silvicultural activities to provide commercial wood products	Cubic Feet (ft ³) offered	9,788
Timber Sale Project Feasibility	Present Net Value	Dollars	\$653,741
Final Efficiency	Present Net Value	Dollars	\$119,996
Social Economic	Impacts to employment supported by project activities	Number of Jobs	97
Social Economic	Labor income impacts by project activities	Dollars	\$3,333,000

Forest Products

Alternative 2 would have a direct effect of offering 9,788 CCF of saw timber for local forest industries with an estimated value of \$663,529. An indeterminate quantity of firewood generated from project activities would be available for commercial or public use with Alternative 2.

Project Feasibility

The estimated high bid for Alternative 2 is calculated to be \$653,741 which is \$634,165 over base rates which indicates that the project is likely to sell and therefore is feasible.

Financial Efficiency

Alternative 2 is financially efficient when all activities are considered. Alternative 2 has a present net value for the timber sale plus other ecosystem management costs of \$119,996.

Table 35 summarizes the project feasibility and financial efficiency, including the base rates, predicted ad rate bid (or estimated stumpage value), total revenue, and present net value (PNV) for each alternative. Because all costs of the project are not related to the timber sale, two PNVs were calculated. One PNV indicates the financial efficiency of the timber sale, including all costs and revenues associated with the timber harvest and required design criteria. A second PNV includes all costs for each alternative, including other activities that are non-timber harvest related.

Table 35. Project feasibility and financial efficiency summary (2015 dollars).

Category	Measure	Alternative 2
Timber Harvest Information	Acres Harvested	771
	Volume Harvested (CCF)	9,788
	Base Rates (\$/CCF)	\$3.00
	Predicted High Bid (\$/CCF)	\$67.79
	Total Revenue	\$663,529
Timber Harvest & Required Design Criteria	Present Net Value	\$663,529
Timber Harvest & Other Planned Activities	Present Net Value	\$119,997

Jobs and Income

Table 36 displays the direct estimates for employment (full-time, part-time, and intermittent) and labor income (direct, indirect, and induced) that may be attributed to Alternative 2. Impacts are shown as though they all occur in one year; in actuality, they would occur over the life of the project, approximately 10 years. The projected effects represent the jobs potentially supported by implementation of the alternative; they do not necessarily represent new jobs introduced into the local economy. Since the expenditures occur over a ten-year period, the estimated impacts of jobs and labor income would be spread out over the life of the project. Most of the timber harvest and wood processing jobs would occur over the first three years of the project. The forest stewardship activities such as harvest and thinning would occur over the first 5 years. The prescribed fire and WUI activities are expected to occur over the entire ten year period.

Table 36. Alternative 2 direct and total employment and income (2012 dollars) over the life of the project (average annual, decade 1).

Analysis Item	Alternative 2
Direct Employment	97
Direct Labor Income (Thousands of \$)	\$3,333
Indirect Labor Income (Thousands of \$)	\$5,084
Total Labor Income (Thousands of \$)	\$16,079

The Modified Proposed Action through its forest products and stewardship activities has the potential to directly support 97 jobs and \$3,333,000 in direct labor income. Indirect and induced spending would provide for a total of \$16,079,000 in potential economic benefit within the economic impact area. The analysis assumes the timber volume processed would occur within the Dixie NF's zone of influence. However, if some of the timber were processed outside the region, then a portion of the jobs and income would be lost by this regional economy.

Cumulative Effects

Forest Products

The recent three year average for timber cut yearly on the Dixie NF is estimated at 7,960 CCF. This is the volume that is actually processed yearly at regional sawmills and contributes to economic impacts. Alternative 2 proposes to offer an additional 9,788 CCF with project activities. The cumulative impacts to forest products cut would be a one year increase in forest product processing of up to 17,748 CCF if all processed in one year.

Table 37. Cumulative effects for Alternative 2.

Resource Element	Indicator	Measure	Alternative 2	Past, Present, and Future Actions	Cumulative Impacts
Forest Products	Use silvicultural activities to provide commercial wood products	100 Cubic Feet (ft ³) cut & processed yearly	9,788	7,960	17,748
Social Economic	Impacts to employment supported by project activities	Number of Jobs	97	1,092	1,189
Social Economic	Total labor income impacts by project activities	Dollars	\$16,079,000	\$95,472,000	\$111,551,000

Jobs and Income

The Dixie NF through its annual expenditures and the public's use of the forest currently provides or supports 1,092 jobs. The Modified Proposed Action could potentially add 97 jobs for a total of 1,189 jobs or an 8.9 percent increase in employment within the analysis area. The Dixie NF through direct, indirect, and induced spending generates over \$95,472,000 in economic impacts. Alternative 2 could provide an additional \$16 million for a total of about \$111,551,000 or a 16.8 percent increase in economic impacts within the analysis area.

Alternative 3

Direct and Indirect Effects

Table 38. Resource indicators and measures for Alternative 3.

Resource Element	Indicator	Measure	Alternative 3
Forest Products	Use silvicultural activities to provide commercial wood products	Cubic Feet (ft ³) offered	5,261
Timber Sale Project Feasibility	Present Net Value	Dollars	\$224,803
Final Efficiency	Present Net Value	Dollars	-\$60,323
Social Economic	Impacts to employment supported by project activities	Number of Jobs	49

Social Economic	Labor income impacts by project activities	Dollars	\$1,671,000
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Forest Products

Alternative 3 would have a direct effect of offering 5,261 CCF of saw timber for local forest industries with an estimated value of \$230,064. An indeterminate quantity of firewood generated from project activities would be available for commercial or public use with Alternative 3.

Project Feasibility

The estimated high bid for Alternatives 3 is calculated to be \$224,803 which is \$214,281 over base rates which indicates that the project is likely to sell and therefore is feasible.

Financial Efficiency

The information displayed in Table 38 indicates that Alternative 3 is financially efficient for the timber sale, but financially inefficient when all activities are considered. Alternative 3 has a present net value of -\$60,323.

Table 39. Project feasibility and financial efficiency summary (2015 dollars) for Alternative 3

Category	Measure	Alternative 3
Timber Harvest Information	Acres Harvested	452
	Volume Harvested (CCF)	5,261
	Base Rates (\$/CCF)	\$1. 00
	Predicted High Bid (\$/CCF)	\$43. 73
	Total Revenue	\$230,064
Timber Harvest & Required Design Criteria	Present Net Value	\$230,064
Timber Harvest & Other Planned Activities	Present Net Value	-\$60,323

Jobs and Income

Alternative 3 through its direct effects provides for 49 jobs and \$1.67 million in labor income. Through indirect and induced spending, Alternative 3 has the potential to add an additional \$8.35 million in spending throughout the economic area.

Table 40. Alternative 3, direct, indirect, and total employment and income (2012 dollars) over the life of the project (average annual, decade 1).

Analysis Item	Alternative 3
Direct Employment	49
Direct Labor Income	\$1,671,000
Indirect Labor Income	\$2,570,000
Total Labor Income	\$8,350,000

Cumulative Effects

Forest Products

This alternative proposes to offer an additional 5,261 CCF with project activities. The cumulative impacts to forest products cut would be a one year increase in forest product processing of up to 13,221 CCF if all processed in one year.

Table 41. Cumulative effects for Alternative 3.

Resource Element	Indicator	Measure	Alternative 3	Past, Present, and Future Actions	Cumulative Impacts
Forest Products	Use silvicultural activities to provide commercial wood products	100 Cubic Feet (ft ³) cut & processed yearly	5,261	7,960	13,221
Social Economic	Impacts to employment supported by project activities	Number of Jobs	49	1,092	1,141
Social Economic	Total labor income impacts by project activities	Dollars	\$8,350,000	\$95,472,000	\$103,822,000

Jobs and Income

The Dixie NF through its annual expenditures and the public's use of the forest currently provides or supports 1,092 jobs. Alternative 3 could potentially add 49 jobs for a total of 1,189 jobs or an 8.9 percent increase in employment within the analysis area. The Dixie NF through direct, indirect, and induced spending generates over \$95,472,000 in economic impacts. Alternative 2 could provide an additional \$16 million for a total of about \$111,551,000 or a 16.8 percent increase in economic impacts within the analysis area.

Summary of Effects

Table 42. Summary of effects by alternative.

Indicator	Measure	Alternative 1	Alternative 2	Alternative 3
Use silvicultural activities to provide commercial wood products	Cubic Feet (ft ³) offered	0	9,788	5,261
Present Net Value	Dollars	na	\$653,741	\$224,803
Present Net Value	Dollars	na	\$119,996	-\$60,323
Impacts to employment supported by project activities	Number of Jobs	0	97	49
Labor income impacts by project activities	Dollars	\$0	\$3,333,000	\$1,671,000

Table 43. Summary of the cumulative effects by alternative.

Indicator	Measure	Present and Future	Alternative 1	Alternative 2	Alternative 3
Use silvicultural activities to provide commercial wood products	100 Cubic Feet (ft ³) cut & processed yearly	7,960	7,960	17,748	13,221
Impacts to employment supported by project activities	Number of Jobs	1,092	1,092	1,189	1,141
Total labor income impacts by project activities	Dollars	\$95,472,000	\$95,472,000	\$111,551,000	\$103,822,000

ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and Departmental Regulation 5600-2 direct federal agencies to integrate environmental justice considerations into federal programs and activities. Environmental justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment.

Implementation of any of these alternatives will be consistent with this Order and will not have a discernible effect on minorities, American Indians, or women, or the civil rights of any United States citizen. Nor will it have a disproportionate adverse impact on minorities or low-income individuals. No civil liberties will be affected. Public involvement and comment was sought and incorporated into this document. The Forest Service has considered all public input from individuals or groups regardless of age, race, income status, gender, or other social/economic characteristics (see project record).

Census bureau statistics cited on pages 17 and 18 of the Social Economic Specialist Report and other data in the project record suggest that none of the counties in the analysis area have low income or minority populations that exceed 50 percent of the general population or that the minority population percentage of the affected area is meaningfully greater than the minority

population percentage of the general population. Based on this information, there would be no adverse human health or environmental effects associated with any alternative of the Mitchell Spring Project on minority or low-income populations within the economic analysis area. There is no indication that the Mitchell Spring Project would adversely or disproportionately affect American Indians, other racial minorities, or low-income groups.

COMPLIANCE WITH OTHER LAWS AND REGULATIONS

National Forest Management Act

The following findings are made based on the environmental analysis for the Action Alternatives 2 and 3.

Consistency [36 CFR 219.28]:

1. Timber harvest would occur on lands suited for timber production or would occur in areas where timber harvest is permitted and is necessary to help achieve other resource management objectives; and 2. Silvicultural treatments are consistent with the Forest Plan.

The forest stands proposed for timber harvest using the individual tree or group selection harvest system meet the criteria of being on land suitable for timber production as described by the Forest Plan on page IV-37 and FSH 2409.13, Chap. 20. The interdisciplinary team (IDT) through field reviews (Silviculture and Climate Report p. 5, Soils Report, p. 9) has determined that the timber harvest sites are within physically suitable forest lands. With adherence to project design features (such as avoidance of steep slopes over 40 percent) and soil and water conservation practices, the harvest activities can occur without irreversible resource damage to soil productivity or watershed conditions (Hydrology Report, pp. 33-35, Soils Report, pp. 33-34).

Table 44. Timber harvest treatment acres by forest plan management areas.

Timber Harvest	Management Area			
	(acres)			
Management Area Code	MA 1	MA 2B	MA 7A	MA 9A
Alternative 2	15	519	213	24
Alternative 3	15	266	169	1

Individual tree and group regeneration harvests are consistent with silviculture prescription requirements of the Forest Plan and its management areas (USDA 1986: IV-38 to IV-39, IV-112, and IV-119 to IV-120). The harvest and other silvicultural treatments are consistent with the desired condition expressed through the Mitchell Spring Project's need to improve and maintain a balance of vegetation structural stages within forested stands for wildlife habitat needs; to thin excess vegetation; and to improve and maintain desirable forest and woodland conditions such as growth rates, vigor, stocking, structure, species and age diversity.

Timber Harvest [16 U.S.C. 1604 (g) (3) (E)]:

1. Soil, slope, or other watershed conditions will not be irreversibly damaged;

The proposed action is unlikely to directly, indirectly, or cumulatively have any measureable effects to hydrology that are contrary to the desired condition (Hydrology Report, pp. 33-35). With soils there is likely to be a measurable increase in detrimental soil disturbance; however, this increase in soil disturbance is estimated to be relatively small and very unlikely to exceed regional standards for allowable detrimental soil disturbance with adherence to project design features and soil and water best management practices (Soils Report, pp. 33-34).

2. There is assurance that the lands can be adequately restocked within five years after final regeneration harvest;

Following harvest treatments using individual tree and group selection, the treated stands are expected to remain stocked or be restocked through natural regeneration within five years. This conclusion is based on existing stand conditions, modeled effects analysis, and monitoring of similar treatments on other local forest sites. Project design features include adaptive management provisions if timely and satisfactory natural regeneration does not occur.

3. Streams, stream banks, shorelines, lakes, wetlands, and other bodies of water are protected from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment where harvests are likely to seriously and adversely affect water conditions or fish habitat;

Soil and water conservation practices implemented in project design and timber contracts are effective in minimizing impacts to site productivity and conserving soil and water resources. For instance, project design features embedded within timber sale contract clauses will be used that implement soil and water conservation practices, such as directional felling, designated skid trails, endlining, etc. (Soils Report, pp. 30-31). Detrimental damage to soils, slopes, or other watershed conditions from the proposed treatments would be minimized when unsuitable soils are excluded from management activities and best management practices are followed (Soils Report, pp. 34-35, Hydrology Report, pp. 33-35). Monitoring of past timber sales indicate that the design features included with the proposed action is adequate to protect soil and water resources (Soils Report, pp. 32-33, (USDA 2013b).

4. The harvesting system to be used was not selected primarily because it will give the greatest dollar return or the greatest unit output of timber;

While forest product outputs were considered in the decision process, other factors related to managing properly functioning ecosystems, reducing surface fuels, and improving wildlife habitat within the project area were the primary factors used to determine the harvesting system.

Even-aged Regeneration Harvests [16 U.S.C. 1604 (g) (3) (f)]:

Even-aged regeneration harvests are: clearcuts (with or without reserves), coppice cuts (with or without reserves), and overstory removal cuts in seed-tree and/or shelterwood methods (FSM 2470.5). Individual tree and group selection harvests are proposed with the Mitchell Spring Project. These treatments are considered an uneven-aged regeneration harvest system, therefore the requirements detailed within 16 U.S.C. 1604 (g) (3) (F) is not applicable.

Culmination of Mean Annual Increment [16 U.S.C. 1604 (m)]: Stands of trees harvested have generally reached the culmination of mean annual increment of growth (CMAI).

“Generally reached culmination” is defined as the age at which the stand achieves at least 95 percent of the cubic foot volume at culmination. The CMAI requirement only applies to even-aged management on lands suited for timber production. The CMAI requirement is applicable at the time of the regeneration harvest. It does not apply to thinning, salvage, or sanitation harvests or to harvests designed to achieve non-timber resource objectives (FSM 1921.12f). CMAI occurs when the periodic annual increment equals the mean annual increment (MAI). MAI is calculated by adding the current stand volume with any mortality and/or previous removal and then dividing by the stand age.

Individual tree and group selection treatments which are an uneven-aged regeneration and harvest system are proposed with the Mitchell Spring Project, therefore the requirements detailed in 16 U.S.C. 1604 (m) are not applicable. This commercial thinning through individual tree selection and group selection is being used to reduce densities of trees, diversify age classes, reduce disease, and improve vigor, growth, and species composition within forest stands. These treatments are designed to create conditions where forests are resilient to agents of disturbance such as drought, wildlife, or insects.

Endangered Species Act. The Endangered Species Act of 1972 requires that actions of Federal agencies do not jeopardize the continued existence of any species federally listed or proposed as threatened or endangered, or result in adverse modification to species’ designated or proposed critical habitat. The Act also requires that actions that may have potential effects be documented in a Biological Assessment (BA). No critical habitat for any listed species would be impacted with implementation of the Modified Proposed Action.

Executive Order 13186. Executive Order 13186, signed January 10, 2001, directs federal agencies to protect migratory birds by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practical, adverse impacts on migratory birds resources when conducting agency actions. The National Forests in Utah entered into an agreement with the USFWS in August, 2007, and developed a strategy on how to address impacts from agency actions on migratory birds in NEPA documents. Project proposals that follow the strategy identified in that agreement will be considered compliant with the MBTA and E.O. 13186 (USFWS 2007). In addition, the Forest Service entered into a national MOU with the USFWS regarding the MBTA in 2008. Following the Utah agreement will satisfy requirements under the national MOU.

Clean Water Act. The Clean Water Act (CWA) requires each state to implement its own water quality standards. The State of Utah's Water Quality Antidegradation Policy requires maintenance of water quality to protect existing instream Beneficial Uses on streams designated as Category 1 High Quality Waters. All surface waters geographically located within the outer boundaries of the Dixie National Forest, whether on private or public lands, are designated as High Quality Waters (Category 1). This means they will be maintained at existing high quality. New point sources will not be allowed, and non-point sources will be controlled to the extent feasible through implementation of Best Management Practices (BMPs) or regulatory programs (Utah Division of Water Quality 1994). The State of Utah and the Forest Service have agreed through a 1993 Memorandum of Understanding to use Forest Plan Standards & Guidelines and

the Forest Service Handbook (FSH) 2509.22 Soil and Water Conservation Practices (SWCPs) as the BMPs. The use of SWCPs as the BMPs meets the water quality protection elements of the Utah Nonpoint Source Management Plan. The Modified Proposed Action is designed to not change or add fill to waters anywhere within the project area.

Executive Order 11990. This order requires the Forest Service to take action to minimize destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In compliance with this order, Forest Service direction requires that an analysis be completed to determine whether adverse impacts will result.

Executive Order 11988. This order requires the Forest Service to provide leadership and to take action to: (1) minimize adverse impacts associated with occupancy and modification of floodplains and reduce risks of flood loss; (2) minimize impacts of floods on human safety, health, and welfare; and (3) restore and preserve the natural and beneficial values served by floodplains. In compliance with this order, the Forest Service requires an analysis be completed to determine the significance of proposed actions in terms of impacts to floodplains.

All alternatives comply with the Forest Plan and Clean Water Act by not leading to a measureable degradation in water quality (the no-action alternative could indirectly lead to higher severity wildfires and poorer water quality but since it is nearly impossible to predict that a high severity wildfire will result from the no-action alternative it cannot be considered a violation of the Clean Water Act). Also, as disclosed in the Hydrology Resource Direct and Indirect Effects sections, all alternatives are not likely to measurably impact or alter floodplains or wetlands and therefore comply with Executive Orders 11988 and 11990.

CHAPTER 4 – CONSULTATION AND COORDINATION

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

ID TEAM MEMBERS:

Cindy Calbaum, Recreation, Scenery, and Wilderness Character Specialist
Buddie Carroll, Interdisciplinary Team Lead
Keith Gustafson, Vegetation Management Specialist
Marian Jacklin, Archaeologist
Rich Jaros, Soils Specialist
Robert Miller, Transportation Specialist
Josey Muse, NEPA Planner
Drew Parkin, NEPA Planner
Laurie Parry, GIS Specialist
Brooke Shakespeare, Hydrology Specialist
Chance Stewart, Fire and Fuels Specialist
Jessie Warner, Range Specialist
Fran Wilson, Resource Clerk, Project Record Preparation
Hope Woodward, Environmental Coordinator
Nate Yorgason, Wildlife Biologist
Lisa Young, Wildlife Biologist

FEDERAL, STATE, AND LOCAL AGENCIES:

Town of Boulder, Utah
Bryce Canyon National Park
City of Escalante, Utah
Five County Association of Government
Garfield County Commission
Grand Staircase National Monument
Senator Orrin G. Hatch
Town of Henrieville, Utah
Senator Michael S. Lee
Natural Resource Conservation Service
Utah State Representative Michael E. Noel
Congressman Christopher D. Stewart
U.S Fish and Wildlife Service
Utah Department of Natural Resources
Utah Division of Forestry, Fire, and State Lands
Utah Division of Water Quality
Utah Division of Wildlife Resources
Utah Governor's Office of Planning and Budget
Utah Public Lands Policy and Coordination Office
Susan Winter, Economist, USDA Forest Service

TRIBAL GOVERNMENTS:

Hopi Tribe
Kaibab Band of Paiute Indians
Navajo Nation
Paiute Indian Tribe of Utah
Northern Ute Tribe

OTHERS:

Utah Farm Bureau
Grand Canyon Trust
Sierra Club
WildEarth Guardians
Yellowstone to Uintas

Information concerning this project was sent to individuals and organizations that requested information concerning this or similar project proposals involving the Escalante Ranger District of the Dixie National Forest. A list of these individuals and organizations is included in the project record.

APPENDICES

Appendix A. Maps

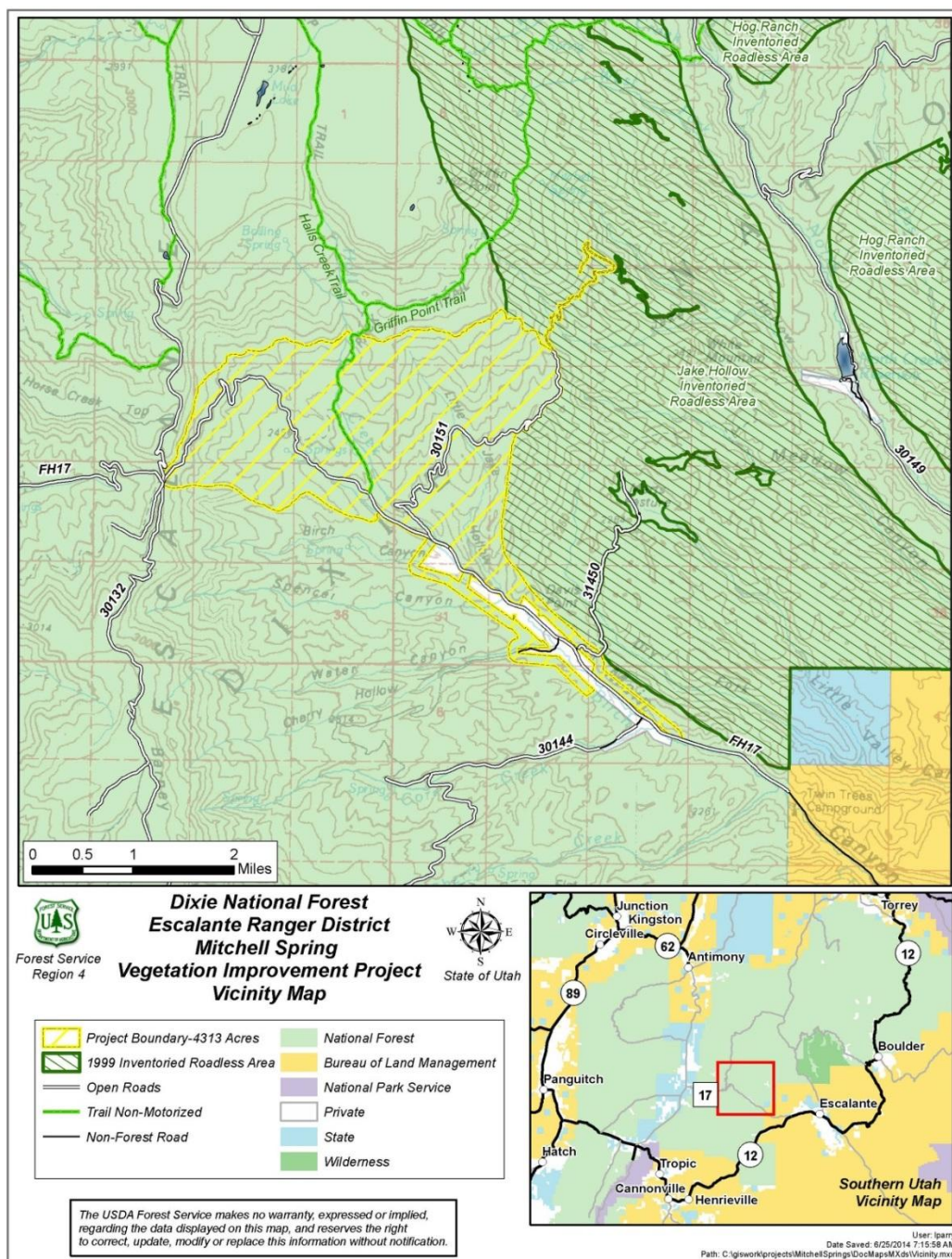


Figure 4. Vicinity map and Inventoried Roadless Areas of the Mitchell Spring project area.

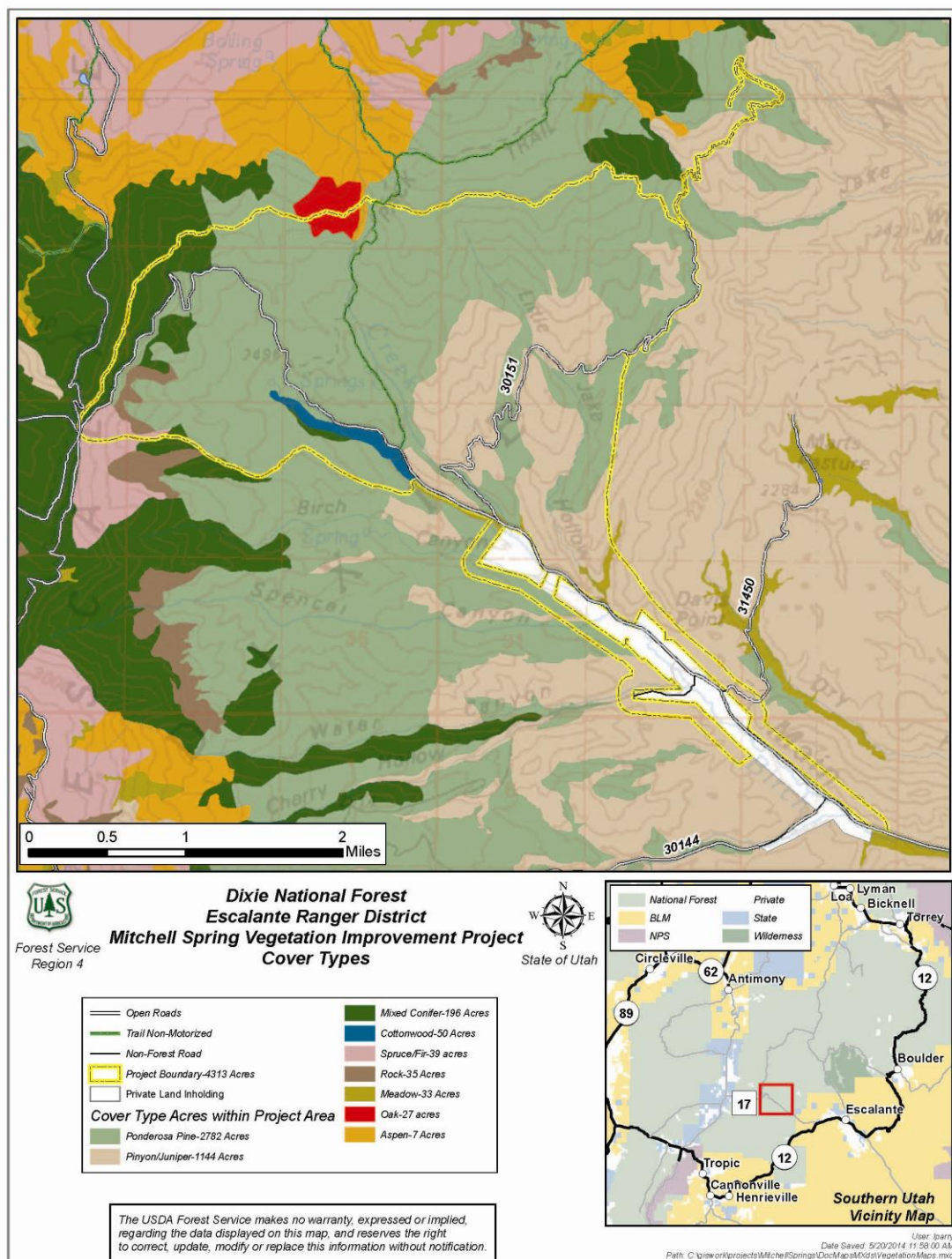


Figure 5. Vegetation cover types of the Mitchell Spring project area.

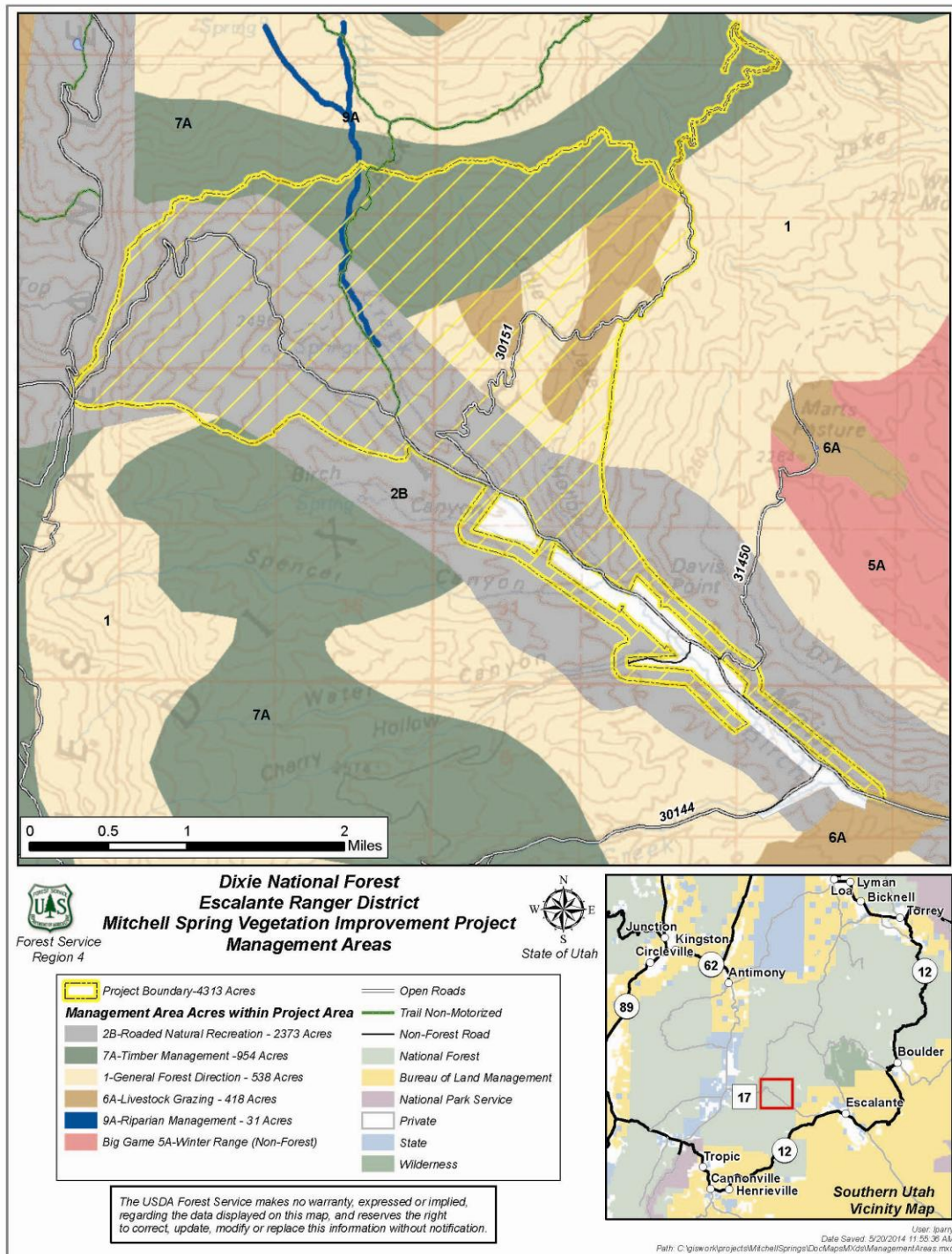


Figure 6. Management areas of the Mitchell Spring project area.

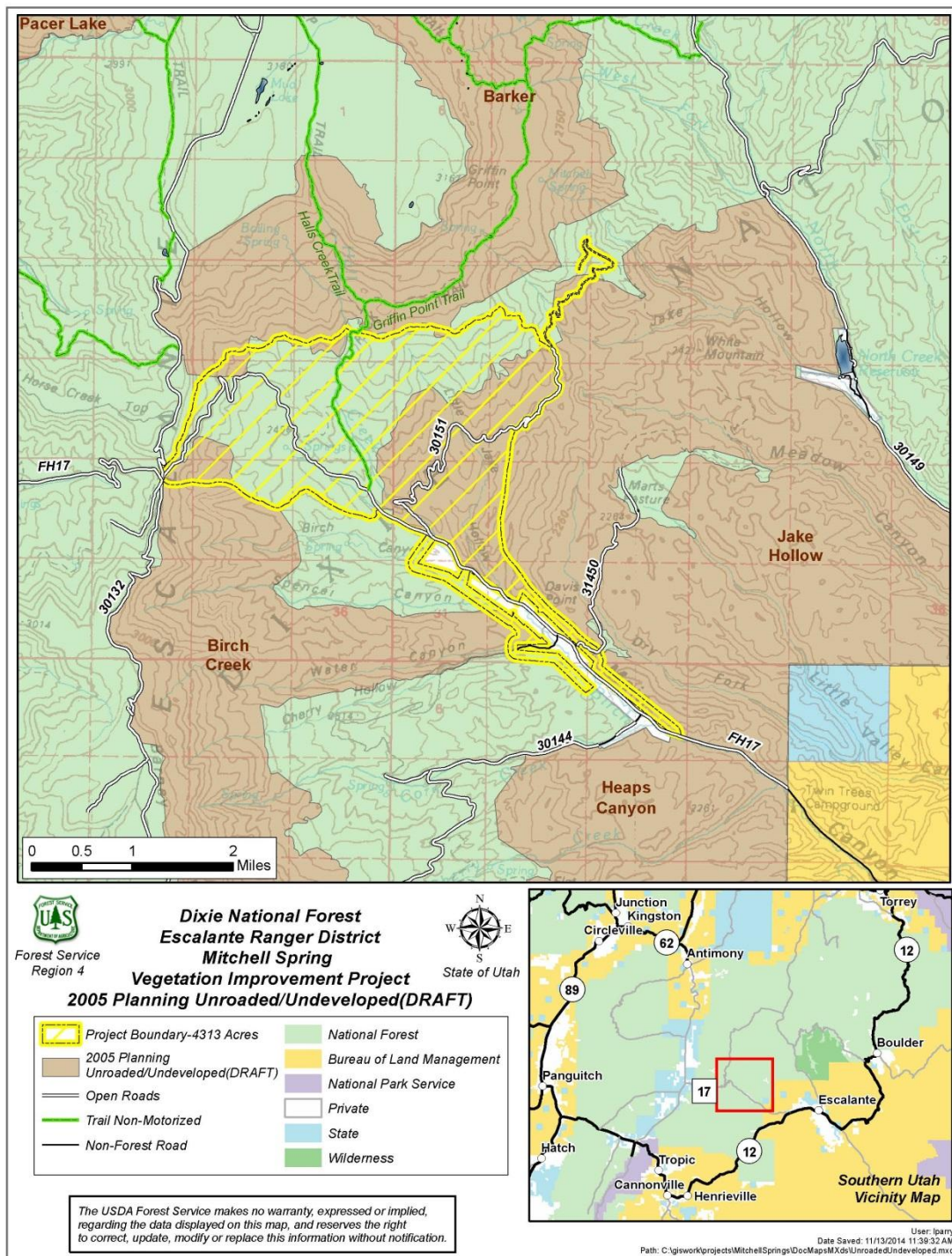


Figure 7. 2005 Planning unroaded/undeveloped areas of the Mitchell Spring project area.

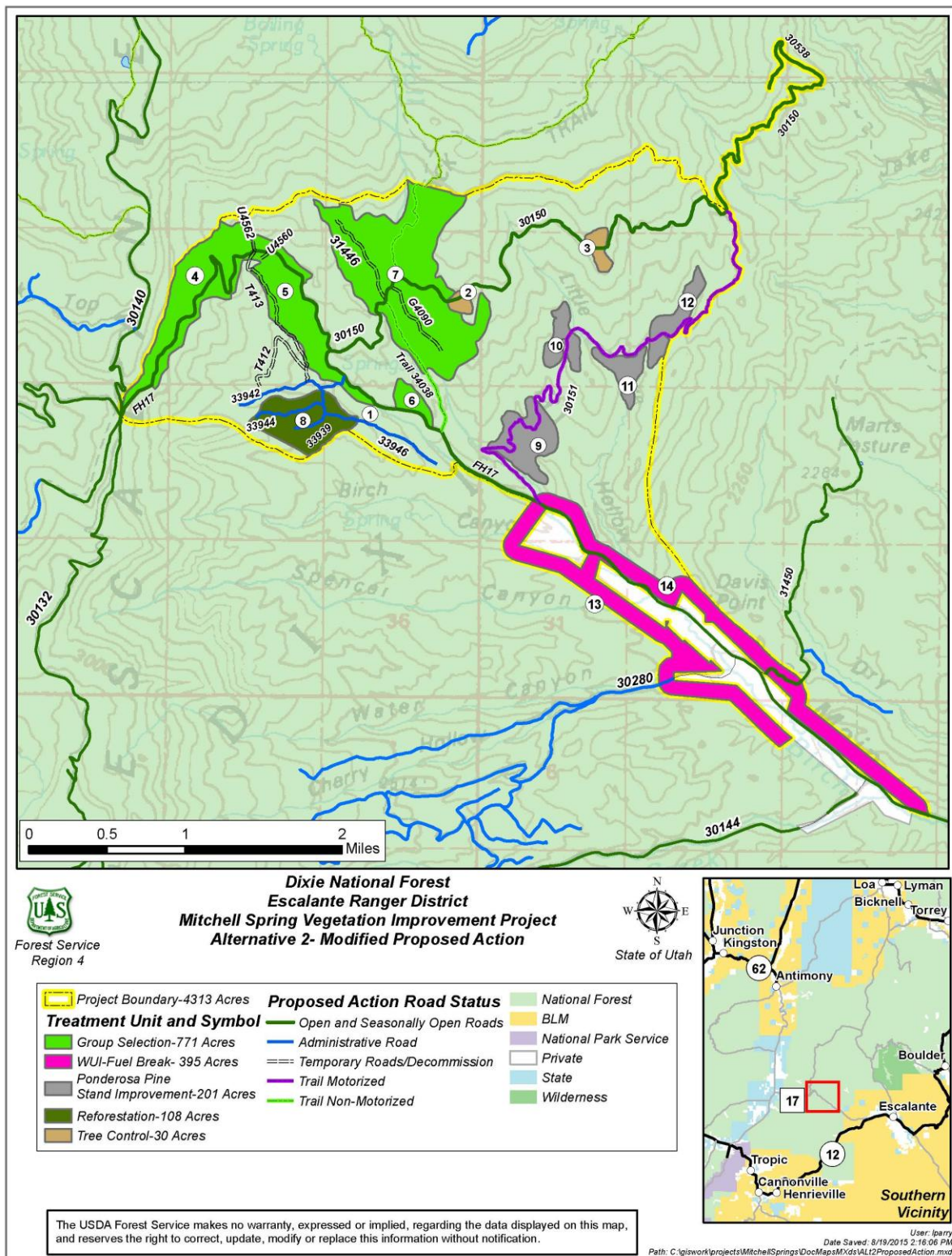


Figure 8. Modified Proposed Action treatment areas.

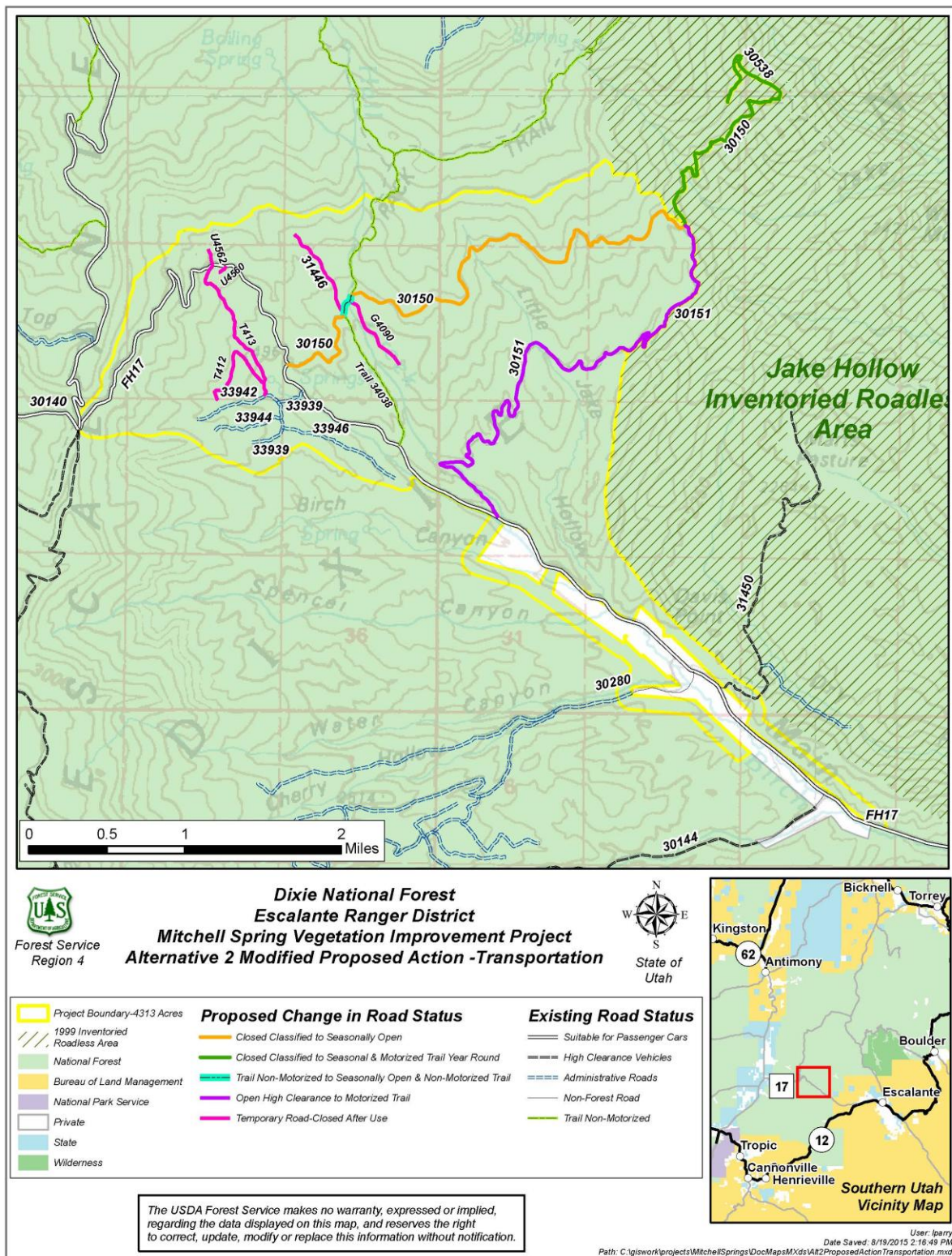


Figure 9. Modified Proposed Action transportation plan.

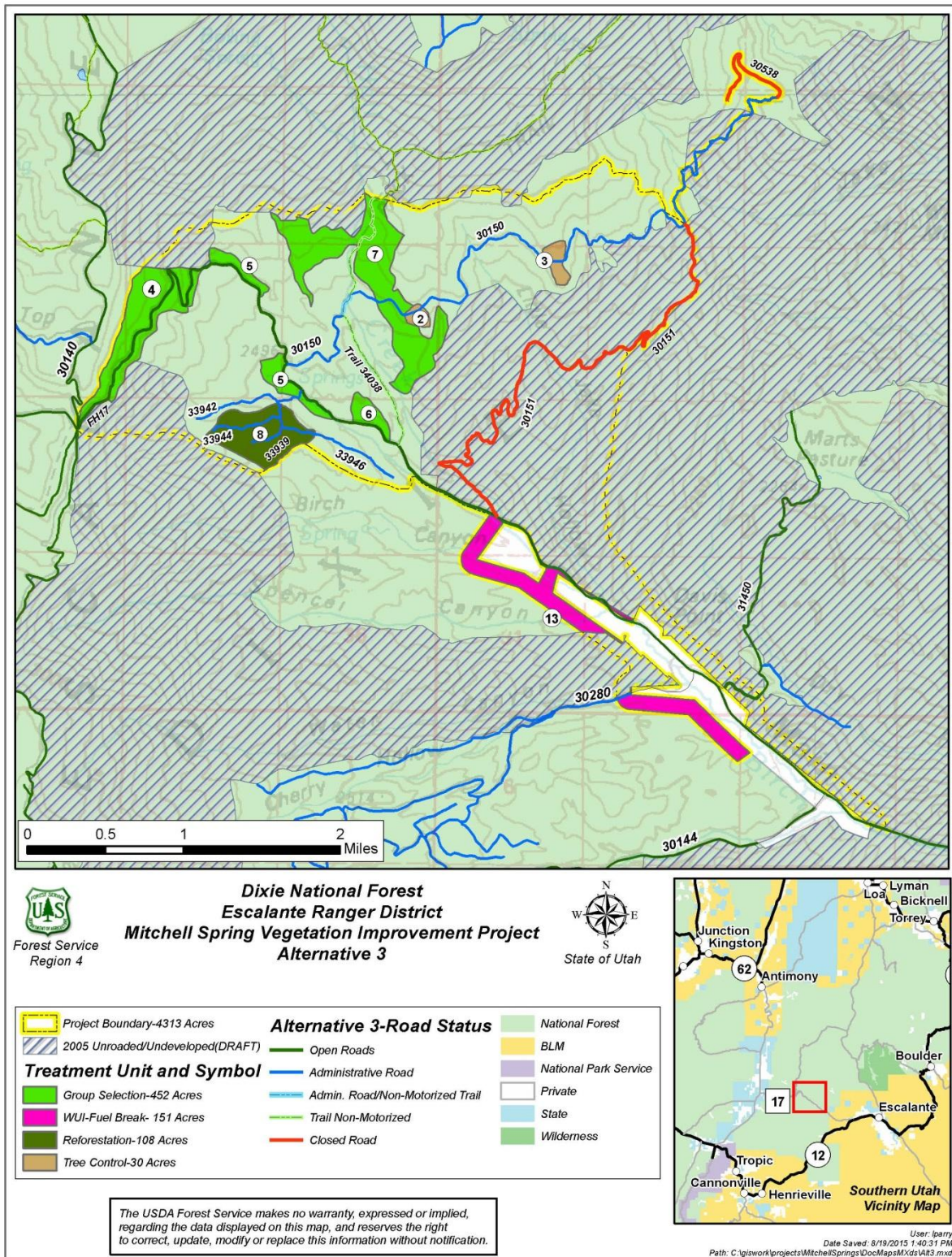


Figure 10. Alternative 3 treatment areas.

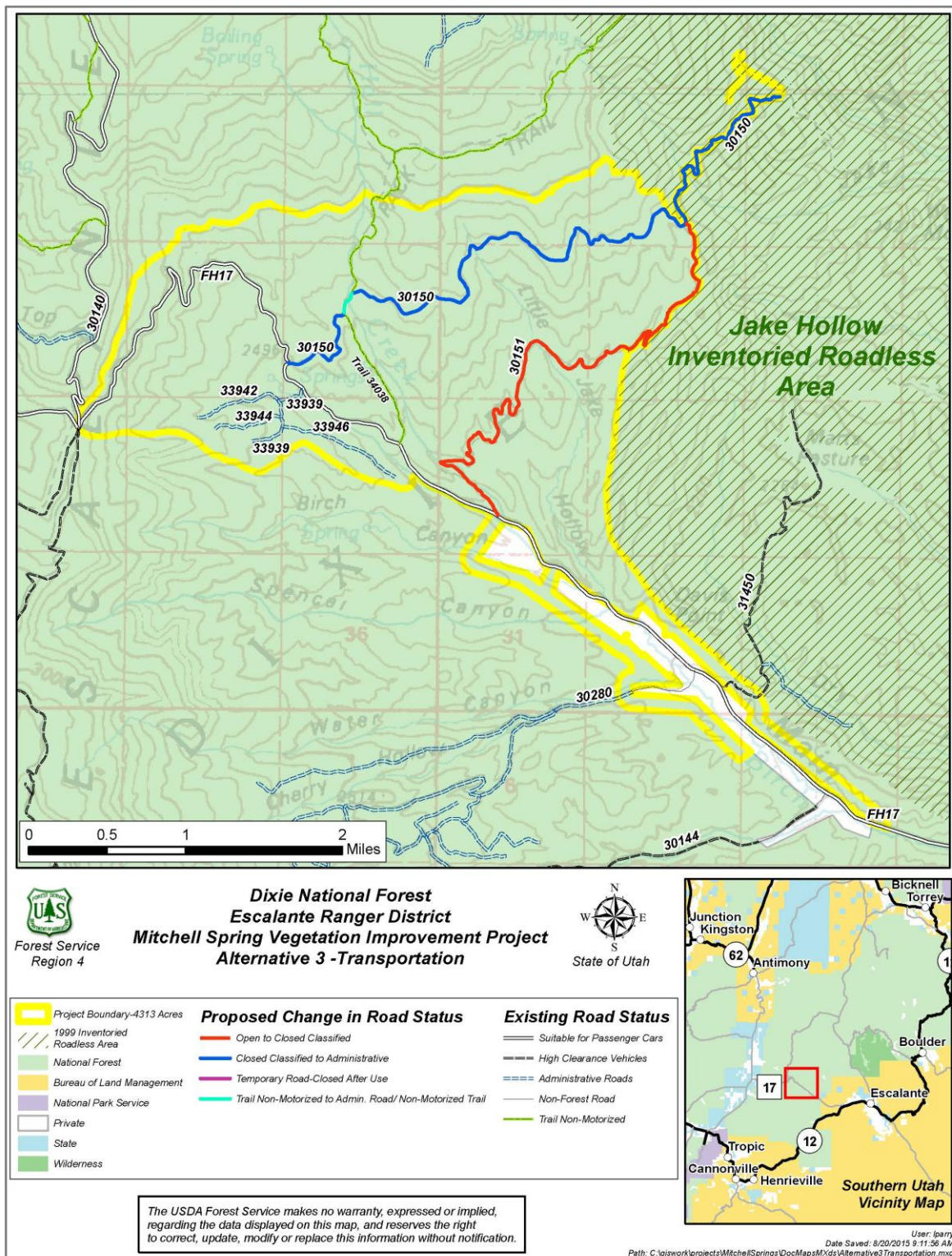


Figure 11. Alternative 3 transportation plan

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